potencies in my practice and I have always been successful in my treatment.

In this connection, I may also add that late revered savant Dr. Mahendralal Sarkar, M.D., D.L., C.I.E., and Drs. D. N. Roy, B. N. Banerjee, Salzer and several others of Calcutta were accustomed to use lower and medium potencies in their practices and they are all known to be very successful practitioners.

In European countries the names of Drs. John H. Clarke, Burford, Stonham, Fergiewoods, George Royal, T. F. Allen, G. P. Cobb, William Boericke, Norton and several others may be mentioned in this connection who were also accustomed to use lower and medium potencies in their practices.

I hope these lines will satisfy Dr. Ganguly and others.

S. C. G.

KALIUM CARBONICUM

DR. O. LUSER

Kalium carbonicum is potash, the carbonate of potassium. The names potash, potassium, as also Kalium, remind us of the main source of the substance from ancient times, viz., the ashes of organic material, especially of plants. The word Kalium, for which the chemical symbol K stands, is derived from the Arabic "al kaljun," *i.e.*, plant ash.

Neither in the earth nor in living organisms do we find the isolated element potassium, K. It is a soft silvery metal. A member of the alkali group the atom has one single electron in its outer shell. There is practically no situation in which such an atom will not act by parting with its outer negative charge, thus becoming a positively charged ion, a cation. The nucleus of the potassium atom possesses an excess or 19 protons over nuclear electrons,

and these 19 protons are balanced by 19 peripheral electrons of negative charge; their distribution in the subsequent shells is (2) (2, 6) (2, 6) 1. (*cf.* Table 3, in No. 1).

In air and in water the atom undergoes immediate change. Water is strongly dissociated, under liberation of heat, according to the equation: $K+H.OH = KOH+H$; owing to the excess of OH-ions a strong alkaline reaction ensues. Even the exchange of charges with a weak acid, like carbonic acid, to potash, $K_2 CO_3$, does not render the reaction in water neutral; potassium carbonate still shows an alkaline reaction in water, i.e., the OH-ions predominate, $K_2 CO_3+H_2 O = KOH+KH . CO_3$.

Significant for the structure of the alkali metals as a group is the fact that they have the greatest atom-volume, i.e. they cover a particularly large field relative to their weight. They react with great speed and are extremely exchangeable. The behaviour of potassium has much in common with the other alkali metals, of which sodium, Na, is of equal importance in living organisms. Their differences, indicated by the respective atomic weights, however predestine each for a different role. It is just because of their similar potential actions that potassium and sodium in many instances appear as antagonists, both in the inorganic and the organic world. Their fate is inseparably connected. From many rocks of the lithosphere, where they are bound chiefly to silicate, the salts of both sodium and potassium are washed out by water; then their migration differs: sodium, mainly linked to chlorine as NaCl, remains in the hydrosphere, most of it passes into the oceans; the bulk of potassium, in the form of various salts, enters into the colloid subtsances, the humus and the living cells of plants. Sodium accumulates in water, potassium in soil and plants and mainly through them into animal organisms. In the organism as in the earth, sodium is predominant in the fluids—potassium in the colloid substance. Theirs is a fundamental balance, an antagonism of actors, the one from within and the other from outside the colloids

of the organism and of the earth. Both elements are indispensable. Their co-peration upholds the tone of these structures (together with their main accessories, calcium—Ca—and magnesium—Mg). From the organisms the potassium returns, of course, to the soil. In the main it remains an inland substance even if its salts are dissolved in water. Rarely are potassium salts found in deposits above sodium and magnesium salts in cases where the water of former inland lakes has completely evaporated. In such circumstances it exists partly as pure potassium chloride, KCl, but more frequently in the form of complex salts with magnesium, calcium, and sodium. Concentration. temperature and pressure thus have determined its fate, for the earth is a chemical laboratory on a grand scale.

Considering the significance of cations, such as K, Na, Mg, and Ca, we are always concerned with the competitive antagonism of similar agents. Their co-operation with anions, like chloride, Cl, carbonate CO_3, sulphate SO_4 and phosphate PO_4, is based on the need for balancing opposite charges; the anions, too, become thus competitors. Under the conditions of the earth in general potassium encounters mainly chloride and sulphate, while in living organisms such biogenic anions as carbonate, phosphate, and nitrate are bound to play a major part in its exchanges and migration. In the life processes we cannot observe the action of isolated potassium, but the carbonate answers most closely our enquiries concerning the actions of potassium in the living organism; for the KOH and $KH.CO_3$ (caustic potassium and sour potassium carbonate) which are immediately formed, have anions ubiquitous in the system. Thus the carbonate of all potassium salts, can be taken to show the actions of potassium at their purest.

This is not to say that the compounds formed by the solution of potassium carbonate in water will explain the whole working of potassium in the organism. As potassium is chiefly an element of the interior of the cells it is beyond our present means of observation to say in what

form potassium exerts its peculiar functions besides, as mentioned above, the balancing of sodium ions on the outer cell-surfaces. Quantitative findings are obviously of little use in that respect. The 2 to 3 grammes of potassium taken up daily by the human organism, mainly from vegetable food, does not allow us to ascertain what quantity or in what physical state it is used in the cell colloids. Potassium moves about freely and at great speed in the system, adjusting itself to the prevailing needs of cells and organs. When it is discharged by one organ it may still be used by another one which is in need of it. Thus we have to reckon with an inner circulation of the total stock of potassium, the potassium being partly in an active and partly in an inactive state.

It is certain that potassium plays an important rôle in the cell functions, for during their active growth the potassium content increases, and when cells disintegrate they lose potassium. During muscular activity the K-concentration in the blood rises, and during rest it falls. Thus potassium migrates out of the cells during the katabolic phase, and into the cells during the anabolic phase, and that applies particularly to muscle cells. Under the abnormal conditions of great losses of NaCl from the body fluids K is forced out of the cells to replace Na. This happens in the case of profuse hæmorrhages, or of shock, or of excessive vomiting caused by obstruction in the stomach or the upper intestines. Further, as we shall consider more closely when discussing Natrium mur., such NaCl-loss occurs when the secretion from the adrenal cortex is deficient, as in so-called Addison's disease. Then the K-level in the serum rises, and the muscles are deprived of it, so it is very likely that the extreme muscular weakness—myasthenia—under these conditions is a consequence of K-deficiency in the muscle cells.

The actions of potassium within the cells are possibly not confined to ionic ones, i.e., such as are due to the surface electrons of the outer orbit of the atom. Potas-

sium, like its neighbours rubidium and cæsium, is a radio-active element. They emit β-rays, i.e. negative electrons, from the atom nucleus. In theory a potential radio-activity for all the elements has been assumed, but that is not to say that such activity can be demonstrated under ordinary circumstances, occurring almost spontaneously, as in the case of potassium: True, the rate of electron-emission is considerably less than is that of the better known radio-active elements; in fact, about only one thousandth part of that of uranium; but in potassium we have before us an indispensable agent in cell processes, and it is conceivable that in that sphere its radio-activity is not entirely insignificant. Indeed the Dutch physiologist, ZWAARDEMAKER, suggested twenty years ago that the β-radiation of potassium serves as an impulse to certain muscle-cell functions which are distinguished by automatism and rhythmicity. This applies particularly to the heart, but also to the smooth, unstriated muscles of the organ ducts and blood-vessels. We know from provings and from medicinal use of Kalium carb, that it has an affinity to the heart as well as to striated and unstriated muscle. We shall see that its action follows mainly the parasympathetic pattern; though as regards the heart we shall find significant modifications, and these might be accounted for by an independent action of potassium in the automatic control system. Are these rhythmic impulses supplied by intra-atomar energy? There is as yet, no direct proof, but ZWAARDEMAKER showed that a heart which has ceased to beat owing to lack of potassium, can be made to contract again in regular rhythm by the rays of various other radio-active elements. This question concerns not only the potassium actions, but also has a profound bearing upon our whole conception of the life processes. If the body uses intra-atomar energy, the theory of energy-balance has to be revised for the organism as it has already had to be revised for our planetary system. The fact that the radio-active minerals of the earth produce a great amount of heat-equivalents on their own

account, i.e., without a supply of sun energy, has profoundly shaken the old theories of the exclusive dependence of our planet upon the sun. The hypothesis of a fiery fluid earth gradually cooling down has become questionable. Hitherto it has been assumed that living organisms obtain all their energy from the sun in the last resort. With intra-atomar energy as an additional source, a new chapter of physiology would be opened. Life processes have probably anticipated the constructive era of exploiting atomic energy.

We have to leave these problems to the future and return to the ionic actions of K. All the alkali-ions tend to influence colloids in their relation to water towards swelling and greater fluidity, they do so generally in reverse order to their atomic weights; this tendency decreases from Li< Na< K< Rb < Cs (that is the so-called lyotrope series, lyotrope meaning with a trend towards fluidity). In this order, reversely to their atomic weights, those alkali cations would facilitate the passage of water, salts and other diffusible substances through the membranes or colloid layers separating the cells (while calcium, the chief representative of the bivalent earth-alkali cations, has the opposite, occluding, effect). However, the colloids of various cells behave differently towards the cations and thus the effects do not uniformly follow the general line of the lyotrope progression. That fact apparently has a connection with the varying cation contents of the diverse cells. As regards potassium these deviations from the general rule have been well studied and are significant in respect of two kinds of cells—viz., red blood corpuscles and muscle cells. Red blood cells are good objects for observing the permeability of the cell membrane. If they are put into a hypotonic solution, i.e., water containing a subnormal salt concentration, the red colouring matter tends to leak out of the cell—this is called hæmolysis. In borderline experiments of this kind it has been established that the alkali-ions favour hæmolysis in the following progression: Li, Na< Cs < Rb < K. Thus potassium has the strongest

hæmolytic action of them all. That is particularly so with human red cells. The hæmolytic effect is the greater, the higher the normal content of K-ions (and of HPO_4-anions) in the cells; and in man it is high, being about twenty times that of the surrounding plasma. The potassium content of red cells varies considerably with the different species of animals; it is also high in horses, pigs, dogs, cats, and rabbits, but low in cattle, goats and sheep. The hæmolytic effect of potassium from outside varies accordingly. Now, this all seems a matter of rather academic interest, but we may learn from it that an agent which is particularly involved in functions inside a cell is particularly capable of injuring such a cell from outside. The fact that a parallel exists between the normal functions of an agent like potassium and its damaging properties, facilitates an understanding of the potential actions of such constitutional substances. We do not yet know what role potassium plays in the red blood cell functions, apart from maintaining the celltone from inside against outside-influences. If potassium should be shown to play an active part in the main function of the red blood cells, viz., in the exchange of the gases O_2 and CO_2, certain symptoms of the drug picture of Kalium carb, would become more plausible. For instance, a kind of so-called anæmia of young girls with puffy, pale complexion and with divers menstrual disorders is claimed for Kalium carb. One should not confuse a well defined diagnostic state of the red cells and their hæmoglobin contents as "anæmia" implies, with differently conditioned syndromes, similar though the symptoms of general weakness, pulsations, chilliness, etc., may appear at first sight. A true anæmia is not warranted to be within the sphere of Kalium carb., but other deficiencies in the red blood cells may well contribute to the picture of the Kalium carb.-type which will be discussed in more detail later.

Great significance attaches to the action of potassium in and on the muscle cells. We have already noted that their rich potassium content diminishes during normal acti-

vity. The gist of the experimental findings is: the K-cations (again, as in red blood cells linked chiefly to HPO_4-anions) in the interior of the muscle cell are indispensable for the irritability of the cell, their migration, balanced by that of Na-cations from outside the cell membrane, creates differences in the electric surface potential and this is responsible for the bioelectric current of muscle irritation. During normal muscle activity the exit of K-cations is facilitated by changes in the permeability of the membranes. We shall further see how the impulses towards this K-departure may normally be transmitted through the nerves, and how stimulation by potassium itself through the nerves may alter this process. First, however, the local effects of potassium administration to the muscle cells from outside should be considered. Of all the alkali-ions potassium is the most damaging when applied from outside in excessive proportion. In this action it is in extreme opposition to sodium, the progression being $Na < Li < Cs < NH_4 < Rb < K$. Potassium acts then, as if the membrane were injured; the irritability of the muscle is temporarily abolished, but the effect can be reversed by Na-ions. Equally, the excitation of nerves by alkali-ions, is influenced in the same order, Na being the least and K the most disturbing agent. Again, as with the red blood cells, we come across a peculiar state of affairs: the same ion which, inside the muscle, is prevalent and indispensable for its function—in this instance, ability to contract—is foremost in impeding this function, when applied, in relative excess, from the outside. In general, skeletal muscle is weakened by an excess of potassium, and we know from the provings that muscular weakness is a feature of the Kalium carb. (and Kalium phos.) drug picture.

As regards the muscle action of Kalium carb. one has to think, not only of the muscle fibre and the motor nerve, but also of the parasympathetic innervation which controls the tone. We shall see that the potassium stimulus shows

a preference for transmission through the parasympathetic nerves.

In the heart muscle, the influence of potassium is principally the same as in skeletal muscle, but the conduction of the automatic and rhythmic impulses through neurons, ganglia and muscle cells make things there much more complicated. Generally speaking, small concentrations of potassium depress, and high concentrations paralyse the heart, and the rhythmicity is affected earlier and more than is the contractility. But even the co-ordinated parts of the heart (sinus, auricle, and ventricle) show different degrees of sensitiveness to potassium, possibly because their K-contents differ. The sinus and auricles are affected by potassium before the ventricles. The pace-making nodal tissue is more resistant to potassium. To a certain extent the influence of potassium is similar to that of the vagus nerve, which slows down the heart beat. Potassium depresses the tone of the heart, in contrast to the action of calcium, the antagonist of potassium. Potassium is indispensable for maintaining the automatism and rhythmicity of the heart function. Experiments with large doses of potassium which disorder the muscle and the intrinsic conducting system of the heart, can give only a rough indication of the normal and abnormal activities of potassium. Any changes effected by moderate or small doses of potassium can occur only via the nerves. Though the depressive, slowing-down action on the heart is, in general, similar to vagus stimulation, it is the difference in the sensitiveness of the divers parts which modifies the effect; this is particularly so as regards disturbances of rhythm, which so much depends on the accurate co-ordination of the functions of the various parts of the heart.. Vagus stimulation and the behaviour of potassium in the muscle cells are closely inter-linked. It is a fact that stimulation of the vagus causes an increase in the output of potassium in the perfused heart; i.e., the heart muscle loses potassium, especially do so the auricles.

Thus there appears to be a reciprocal relation between the impulses of the vagus (parasympathetic) and those of potassium. Potassium stimulates the vagus and stimulation of the vagus activates the flow of K-ions. These inferences from experiments have a bearing on our conceptions as regards the mode of action of our preparations. It is, of course, out of the question that Kalium carb. introduced by mouth, could effectively change the ionic conditions of the heart or any other muscle in a direct way; but it is conceivable, that Kalium carb., properly prepared for the task, may act as an impulse to a delicately poised equilibrium through the vegetative nerve transmitter. Thus the equilibrium in the working muscle cells could be altered; the outcome, either manifestation, aggravation, or disappearance of symptoms, would then depend on the circumstances existing in the muscle, provided the stimulant be suitably adjusted. It is known that the juice expressed from the heart or skeletal muscle produces a typical potassium effect on the heart; also that potassium leaves the heart muscle which has been stimulated through the nerve. The fluid taken out of one heart which has been stimulated, is able to produce stimulation of the vagus of another fresh heart. Whether the stimulating substance is potassium alone, or, as appears more probable, potassium in co-operation with the parasympathetic hormone acetylcholine, is a secondary point. In view of the medicinal action of Kalium salts it is notable that potassium properly adjusted for stimulating a parasympathetic nerve, can profoundly alter the much more massive K-balance in the skeletal muscle and in a whole organ like the heart.

Thus potassium acts generally in a parasympathetic way, which means depression, and decrease of tone, of skeletal and heart muscle, but in respect of the heart, this action is modified by the varying sensitiveness to potassium of the different parts of the heart. Hence, while stimulation of the vagus nerve would slow down all parts of the heart, potassium under certain conditions stimulates the

upper portions (especially the so-called sinus nodes), where the impulses of the heart automatism originate; hence, not only the muscular weakness, but also the rhythmic disturbances are subject to the influence of potassium salts.

As regards the unstriated muscles, the parallel of potassium action with vagus stimulation is, to all appearance, complete. From excess of potassium the tone and the contractions of intestines, uterus, bronchi and arterioles are increased. The conditions for ion-migration are very different in unstriated muscle from those in striated muscle. The voluntary muscle is stimulated by the motor nerve, and the parasympathetic is responsible for the tone only; while in the unstriated muscle the parasympathetic innervation is responsible for stimulation and tone.

The vagal constriction of blood vessels can be demonstrated by injecting the potassium salt into an artery so that it reaches the peripheral vessels before the heart. In that case the blood pressure rises. Otherwise, the depression of the heart would overshadow the effect and the blood pressure would fall. The contractions of other smooth muscle through potassium salts have been ascertained by experiments on isolated organs.

Peripheral nerves appear to behave towards potassium like skeletal muscle, so far as is known. The cations depress the irritability of nerves in the same progression as they do muscle, i.e., potassium most strongly. When injured, a nerve liberates potassium at the place of lesion. Potassium ions are necessary for the normal nerve-muscle transmission of impulses; but, when a concentrated solution of potassium salt is applied to an exposed nerve, the connected muscles contract, though much weaker and shorter than from a similar solution of sodium chloride. Hypertonic salt solutions generally act as stimulants but with potassium salts, the depressant action soon becomes manifest. On sensory nerves potassium appears to act similarly; it is indispensable for the normal conductivity,

but if potassium salts are injected into the nerve, the conductivity is suspended and the effect is anæsthesia. It has even been suggested that the accumulation of potassium from an injured nerve-fibre plays a part in the following anæsthesia. Milder disorders of the potassium flow in sensory nerve fibres are, however, likely to manifest themselves as pains. Indeed, the *sharp stitching pains* called neuralgias because they run across the nerve trunks, are quite familiar symptoms in the drug picture of Kalium carb. Such disorders are not of an inflammatory nature, but concern primarily the conductivity of the nerve fibres.

Finally, potassium appears to be no less vital in the central nervous system for the normal transmission of impulses; this implies optimal relation to the other ions. Excess of potassium depresses, and may even paralyse the centres. Absence of potassium in experiments on animal nerve centres also had a depressant effect. Thus, in between, there must be a phase where potassium favours normal stimulation.

On the whole, we should expect Kalium carb. to act chiefly on the neuro-muscular system, on the heart and on the smooth muscle of the organ ducts; the general trend being "vagotonic". This is indeed the field of Kalium carb. known by symptoms from provings and confirmed in homœopathic use. All the scientific experimental evidence cannot change or modify our symptom picture of Kalium carb., but this evidence is very helpful in giving us an ordered understanding of the otherwise unwieldy mass of observed details.

Apart from homœopathy, neither Kalium carb. nor other potassium salts are used on account of the special properties of the potassium ion. One rare but notable exception is the use of potassium salts (mainly of the chloride) in grave muscular weakness—myasthenia gravis—and some improvement in the muscle-function has been reported from the administration of large doses. What can be the rationale for the use of a muscle depressant like

potassium, if it be not on homœopathic lines? In the bouts of a rare disease, known as familial periodic paralysis, the potassium level in the serum is very low, and by administering potassium salts by the mouth the attack can be checked; but, in these conditions, it is merely a palliative effect. In the muscular weakness from Addison's disease, the serum level of potassium is high but that of sodium is low. In that case, massive sodium chloride administrations, and not potassium salts, temporarily improve the muscular weakness.

In the practice of the ordinary school, no distinction is made as to whether anions, like bromide, iodide, etc., are introduced as potassium or as sodium salts; though, on the strength of animal experiments, warnings have been given against the use of potassium salts as being deleterious to the heart. It is obvious, however, that the organism, by its regulating mechanisms, can rapidly dispose of orally introduced excess of potassium. Quantitative considerations do not meet all the circumstances. Provided there is a susceptibility to potassium, the effect will depend on suitable preparation rather than on concentration of the salt.

Only under such circumstances can we expect Kalium carb. actions to become manifest in provings. So far we have to rely on HAHNEMANN'S provings recorded in his "Chronic Diseases" (Die Chronischen Krankheiten, vol. 4, p. 206, 1830) and on subsequent experience in applying these observations. In 1925, I conducted a proving of Kalium carb., and though it has its distinct faults, it may find its place here in lieu of something better.

PROVINGS.

The first series with Kalium carb. 30x: 7 provers, including three doctors, was without any results.

In the second series, with 3x, for 4 weeks, 3 times a day 10 globules; 11 provers including 6 doctors.

Five provers produced no symptoms which could be attributed to the test substance.

Of the other six:

1. Lady doctor (35) suffering from chronic coryza noted only increased discharge of nasal mucus.
2. Female prover, age not stated; showed such an aggravation of existing complaints that it was described as "heart collapse" and "failure of mental functions" (apparently fainting).
3. Male doctor (approx. 70), the symptoms of existing lumbago pains in the right lumbar region were much aggravated during the proving; the pains were relieved by rest and warmth. Further observations: aversion to mental exertion, a great desire for mental rest.
4. Male doctor (33). During the first six days, regularly about three minutes after taking the dose, a dull sensation in both temples, radiating into the upper jaw and sometimes amounting to a drawing pain. On second day (after six doses) a stitching pain in left tonsil on swallowing (only once noted). On third and fourth day, approximately 15 minutes after taking dose: sensation of oppression in heart region (noted three or four times).

   On second, third and fifth days drawing pains in left arm mainly along nervus radialis.

   Slight lassitude during the first week of the proving.

   No other symptoms.
5. Female (17), weight 77 kg., pulse 60, syst. B.P. 120. (Nothing abnormal during preceding observations).

   1925.

   17th May. Started taking 10 globules three times a day. Cheerful.

   18th & 19th May. Tired feeling, especially in the thighs. Deep wrinkles round eyes.

   20th May. Pain over eyes, chiefly stitching over left eye.

21st May.	Tired feeling.
25th & 26th May.	Headache over eyes.
29th May.	Tired feeling in legs, especially joints.
1st June.	Headache over eyes.
2nd June.	Tired, at times headache.
4th June.	The period now due has not appeared.
5th June.	Stitching pains towards the heart.
7th June.	Lassitude in joints.
8th June.	Deep wrinkles around eyes.
9th June.	Tired feeling chiefly in thighs.
12th June.	Lassitude, especially in joints.
14th June.	Headache over eyes.
16th June.	Stitching pains in sacral region, radiating to hips.
17th June.	Period (13 days overdue), abnormally strong.

6. Female (20), weight 59½ kg., pulse 64, syst. B.P. 100. Menses: strong. No abnormality during preceding observation.

17th May.	At times very cheerful, amorous.
19th May.	Pains in sacral region and on breathing. Often hungry feeling.
20th May.	Tiredness in legs. At times headache towards the eyes.
22nd May.	Stitching pains in back and over chest. Pressure felt in stomach.
23rd May.	Headache. Pressure in stomach.
24th May.	A "peculiar" feeling in stomach. Much headache.
25th May.	Tired and tearful, depressed.
26th May.	Lassitude in thighs and headache. Appearance of period.
26th & 27th May.	Terrible pains in sacral region.
28th May.	Sacral pains the whole day.

29th May.	Abdominal pains in the evening.
30th May.	Vomiting during night, bad sleep.
31st May.	Extremely weak and fatigued during forenoon.
2nd June.	Thirst.
4th June.	Cold hands and feet.
5th June.	Pains in lower abdomen & in sacral region.
6th June.	Pains in lower abdomen and headache.
7th June.	Headache.
8th June.	Tiredness in thighs & pains in sacral region.
9th June.	Pains in chest.
11th June.	Headache.
13th & 14th June.	Pains in chest and in back.
16th June.	Lassitude in limbs.
18th & 19th June.	Pains in lower abdomen, like stitches.
20th June.	Headache.

Of course, none of the provers knew the test substance.

This is by no means an exemplary proving. The observations are meagre and their description often lacks precision. Also, the choice of globules of 3x potency was not a happy one. It should have been trituration; but at the time I was not aware of the implications; the proper preparation, up to 6x, of salts like Kalium carb., though soluble, is by trituration. The proper further course would have been to choose the two apparently susceptible girls for continuing the proving with other potencies; and to make another attempt to select suitable Kalium carb. provers from a fresh series of persons.

As far as the observations go, however, a predilection of Kalium carb., as regards weakness and pains, for the sacral region and thighs (especially in female provers) and for the heart, further the prevalent stitching character of pains, are corroborated. The unusual delay of the period in one girl is noteworthy.

The drug picture of a normal body constituent like Kalium carb. is not easy to elaborate or to comprehend. At this stage, we are far from having it complete, let alone perfect. Many observations need confirmation or greater precision, many of our explanations are bound to be tentative. All the same, it is astonishing to what extent the observations from homœopathic provings and practical application lend themselves to an ordered understanding by the facts revealed by recent research. If the one or the other explanation is still tentative, it is for future research to correct it, and it is the task of more and better provings to improve on the material from which an integrated whole of the potential actions has to be drawn. Even as the matter stands at present, however, Kalium carb. seems not to have attained that place in homœopathic practice which it deserves.

A distinct type of the Kalium carb. patient is emerging from observations: *Chilliness* with *local pains from cold, muscular weakness, weak heart inclined to irregularity, feeble circulation* and *tendency to œdema; lowered psychic resistance as part of the general weakness, exhaustibility;* and the *unstable equilibrium in the parasympathetic control of organ functions* vaguely summarised as vagotony.

Firstly, Kalium carb. is one of the "cold" remedies. None of its actions is such as to stimulate the chemical metabolism of the organism, as a sympathico-mimetic remedy like Iodine is known to do. A "parasympathetic" agent, with the cation being prevalent, acts primarily on the tone, not on the energy-transformation of the working cells and thus appears as the full contrast to the warm, accelerating anion-type so conspicuously represented by Iodine. The Kalium carb. patient is *sensitive to cold, to the slightest draught, prefers the warm room. He feels the cold as pains; pains and feeling of coldness, in parts; on application of local warmth the pains shift to another place.* This shifting of pains is one feature, another is the *stitching character of*

pains, and a third the *cold sweating over the affected region.* The sweating is of the type which occurs even on slight and ordinary exertion, as a sign of weakness and lowered resistance. This is particularly so at the site of *predilection* of Kalium carb. the *lumbar and sacral region of the back,* from which the *pains* may *radiate through the hips into the thighs.* The combination of coldness and pain may be found in other regions, too: headaches which come on from driving in cold wind; the patient desires to cover his head when outdoors. On forced inhalation of cold air, a burning pain in the region of the frontal sinus causes headache. On re-entering a warm room these pains cease and the dryness of the mucous membranes gives place to increased nasal and post-nasal secretion. Neuralgias of the head are worse in the cold and relieved when the nasal secretion sets in again. Even in the auditory passages the cold may be felt, hence the peculiar sensation "as if cold air blows into the ear."

In the throat a feeling of a splinter, stitching, may be aroused by cold. The gastric symptoms are worse from cold drinks. A cold sensation is reported in the abdomen, it may accompany colics, and warm applications relieve. Coldness may be felt also in the chest. The extremities, especially hands and feet, are cold. The Kalium carb. patient is *easily chilled,* he feels *better in a warm climate. Chilliness* is accentuated *before* the *menses;* that indicates an instability in the parasympathetic regulation on which, at this stage, special demands are made. *Chilliness* is recorded to be worse even *after exertion and eating,* that is a sign of weakness, of a lowered potential of activity; the same state which makes the vagotonic Kalium carb. patient *sweat on slight provocation, even from eating,* and *from mental as well as from mild bodily exertion.* His exhaustibility may show *tiredness, lassitude and sleepiness aggravated by the same circumstances,* it is *worse after eating, after slight physical or mental exertion.* The lowered potential of functions, a weakness which makes normal activity

a strain, may manifest itself as *dim, weak sight,* with *spots,* the so called *"mouches volantes" plentiful before the eyes.* These and other symptoms of exhaustion are, with the Kalium carb. patient, *worse after sexual intercourse.* Sexual excesses may contribute to and prolong the described state of general weakness; or the syndrome may be due to exhausting diseases, loss of blood or other body fluids; menstruation brings it more to the fore. The weakness of Kalium carb. patients is constitutional in the sense that the recuperative power of the person is on a low level. Kalium carb. is therefore not a remedy to revive frustrated defence efforts of the body, it does not make re-appear old disorders, the origin of chronic sequelæ; but it elevates the tone, the resistance generally, as it shows itself capable, in other circumstances, of lowering the vitality too.

The affinity of Kalium carb. to the heart contributes to the syndrome of *feeble circulation.* Not only do the *extremities* tend to be *cold* but they *become easily numb,* for instance, the legs on crossing them. The same occurs in the parts on which the patient lies. This stagnation is *relieved by moving about.* The tips of the fingers, the toes and the soles, may be sensitive, and painful. The *skin* is *cold, pale* and *puffy,* especially so with girls suffering from menstrual disorders. Whether or not a lowered gas exchange in the red blood corpuscles plays a part in such "anæmic" cases, must be left open, as already mentioned.

In the drug picture of Kalium carb. weakness of the heart cannot be separated from the parasympathetic lowering of the tone of the blood vessels. Thus the feeble circulation may be due to weakness of the heart muscle, but it can be and often is conditioned by more general factors. The *tendency to œdema* thus may arise from weakness of the heart, but also from stagnation in the tissues through impeded exchange of fluids and ions. Wherever alkali salts accumulate they attract water in order to restore the osmotic equilibrium. Thus when K-ions, under certain

conditions, should be kept temporarily out of proper circulation, a local œdema would occur. Possibly the *œdematous bag of the upper eye-lid,* under the eyebrow, which has been stressed by BOENNINGHAUSEN as a symptom indicating Kalium carb., is so explained. The symptom is said to occur particularly in cases of whooping cough, when Kalium carb. proves helpful.

The actions of Kalium carb. on the heart in particular and some consequences in other organs will be discussed later. The type of the Kalium carb. patient in general combines weak heart and feeble circulation with weakness in the skeletal muscles. Loss of power of the voluntary muscles may be such that it is felt to be bordering on paralysis; the lumbar and the sacral region and the legs are particularly involved; *the legs* may *give way suddenly,* so that the *patient is overcome by extreme weakness in his back, thighs and knees when walking in the street,* and is compelled to sit down somewhere. The loss of power may be accentuated by *twitching and trembling of the muscles;* on ascending stairs it becomes more manifest. Possible the *stiffness and the shifting* pains in the Kalium carb. picture are connected with this loss of tone in the muscles, for it is noteworthy that they, too, concern preferably the back, especially the lumbar and sacral region, and radiate into the glutæi, the hip joints and the thighs, going up and down. This syndrome appears often in connection with pregnancy, after miscarriage or during menstruation. Occasionally the paralytic weakness may be seen in other muscles as well, for instance as heaviness and drooping of the upper eye-lids; or the sphincter muscles of rectum or bladder may be affected so that difficulties in evacuating the stool arise or urine is involuntarily discharged when coughing or sneezing. But these syndromes are much more indicative for Causticum, that other remedy of the alkalis which is appropriately dealt with under Ammonia.

A peculiar feature is *circumscribed perspiration from a cold skin* in areas affected by muscular weakness and pains. *Cold aggravates the symptoms in general,* whilst *warmth tends to relieve them locally, but the pains tend to shift to another place.*

The pains of Kalium carb. appear frequently with signs of stagnation in the tissues. Not only the symptoms of feeble circulation but also the *pains* of Kalium carb. are *aggravated by lying on the affected parts.* This is opposite to the modality of Bryonia, where the sharp, stitching pains are due to inflammation. Kalium carb. has primarily no inflammatory features. It is irrelevant whether one calls the tissue conditions of the Kalium carb. type "rheumatic"; such a diagnosis adds nothing to our knowledge, indeed rather effaces the peculiarities of the syndrome.

Lowered resistance in the central nervous system and vagotonic trend in the involuntary, vegetative nerve control determine the mental picture of the Kalium carb. patient. The lack of general tone, the weak circulation, the low or impeded conductivity of nerve impulses makes the patient *disheartened, anxious and fearful,* not only in face of real, but also of imagined, threatening demands made by his environment; he cannot cope with them and becomes *ill-humoured* and *irritable.* A peculiar vagotonic trait is that he *feels sudden fright and anxiety in the gastric region.* Altogether, the type expressing the weak points of the person as a whole is what matters foremost in recognising and selecting such a constitutional remedy like Kalium carb. It is futile as well as ill-conceived to draw a line between bodily and mental, or structural and functional symptoms in the picture of the potential actions of a medicinal substance.

Among the organ actions of Kalium carbb. those on the heart are outstanding. The other organs are either involved through the insufficiency of the heart and circula-

tion, or their disorders show the parasympathetic disposition. The heart, its contracting muscle as well as its impulse-conducting system, is subject to the action of Kalium carb. in a particular way as experimental research has shown. In homœopathy, this was long before known from the proving which recorded a great number of symptoms related to the heart, and the affinity has been confirmed by the use in similar disorders. The rhythmic disturbance manifests itself as *frequent intermission of the heart beat.* The numerous sensations of the heart are chiefly:—*palpitations with ānxiety, particularly when hungry; stitching pains in the left chest on deep breathing, pain round the heart as if it were encircled with a band,* most noticeable on deep inhalation or coughing; walking on level ground does not aggravate, but ascending stairs or hills brings out the symptoms of a weak heart, and makes breathing difficult. Signs of a more advanced stage are: *dyspnœa in the early morning, oppression in the chest with sighing, laboured respiration, râles on the chest at night on lying on the back;* difficult breathing may awake the patient during the night. Breathing may become rapid and superficial so that the patient can hardly stop breathing long enough in order to eat, drink or swallow. Spasmodic and choking cough may occur in this condition at the *worst time* for the Kalium carb. patient, *about 3 to 5 o'clock in the early morning.* This is the time of low tide for energy-production, temperature is at its lowest, weak hearts give way most frequently at this time, as the frequency of death from heart failure in the early morning hours appears to confirm. The description recalls the familiar condition of the respiratory sequelæ of a failing heart, when the lower parts of the bronchial ramifications are unable to rid themselves of the stagnating phlegm—so-called hypostasis. Kalium carb. has its main field in the early stage, when the first signs of insufficiency of the heart show themselves. I well remember such a patient who, some 23 years ago, served me as an accurate illustration of Kalium carb. He

responded within a few days to the remedy so that he was free of symptoms after a fortnight. Sometimes the choice between Kalium carb. and Carbo. vegetabilis is not easy in cases of this kind. One has to remember that charcoal always contains potash; the study of Kalium carb. helps to understand the drug picture of Carbo. veg.

As with most heart remedies, the heart symptoms, especially the *stitching pains and dyspnœa,* are *worse from lying on the left side.* For Kalium carb. this coincides with the *aggravation from lying on the affected side generally.* Stagnation in the small bronchial tubes, without manifest involvement of the heart, are also asserted sometimes to indicate Kalium carb. The lower third of the right lung is said to be an elective site; a dry shattering cough produces scanty, tenacious phlegm, difficult to remove. In such a case, the sharp cutting and stitching pains in the chest are worse on lying on the right, affected side (as against Bryonia in inflammatory processes). If the stagnation is prolonged with coarse râles and loose cough, the little tenacious sputum may have that offensive smell and taste "like old cheese." This peculiarity is described by HAHNEMANN as coming from the mouth, as a gastric symptom; it is, however, outside my experience, and if the personal type should not strongly support the choice of Kalium carb., I would, in these advanced conditions involving the bronchioles so predominantly, not rely too much on the "strange" symptom. When a dry, spasmodic cough, worse in the early morning, persists after influenza, pneumonia, or measles, possibly connected with a weakening of the heart after the disease, it may be a good case for Kalium carb., especially if fleeting neuralgias are present as well. Puffy face and tendency to local œdema would further facilitate the choice. Spasmodic character of the cough corresponds to the vagal trend of Kalium carb. Whooping cough, with the little "bags" under the eye-brows, has already been mentioned.

A sentence in HAHNEMANN'S introduction to Kalium carb. has led to its use in serious progressive lung troubles. HAHNEMANN says there "Seldom will a patient with ulcerative lung processes recover without this antipsoric medicine" he follows up with "often Acidum nitricum is indicated after Kalium carb." Symptoms which could support this indication are very meagre indeed in HAHNEMANN'S provings. It may well be that so many authors drag along such a diagnosis as an indication for Kalium carb. from sheer reverence for every word of the master, and have extended it even to cover pulmonary tuberculosis. HAHNEMANN was great enough to be conceded a number of minor dubious or even untenable statements. The passage in question may, however, mean to advise Kalium carb. as a medicine to be interposed in the course of the treatment of stagnating lung processes, and to be followed by such remedies as Acidum nitricum. A syndrome of general weakness and failing circulation may well arise and then the hint would be worthy of attention and trial, but to give Kalium carb. without generally agreeing symptoms, solely on a disease diagnosis, would certainly be contrary to HAHNEMANN'S teaching.

The symptoms from the digestive organs are indistinctive; of themselves, they can hardly lead to the selection of Kalium carb. On closer examination the pertinent, rather vague symptoms can be readily interpreted by the described main features of Kalium carb. A slowing down of all the digestive functions with particular distension from gas in the abdomen is sometimes one of the first manifestations of heart insufficiency. This has been described as "gastro-cardiac" syndrome. Relevant details in the picture of Kalium carb. (most of them more pronounced in Carbo veg.) are: a *sensation of distension* in the stomach and abdomen with a *feeling of coldness, fullness, and heaviness, temporarily relieved by discharge of flatus or eructations, worse after eating and from cold drinks; better from warm applications; a feeling of weakness, "sinking" in the*

stomach not relieved by eating, even worse during and after a meal; aversion to all food, especially brown bread (*cf.* Natrium mur.) and meat, desire for sour things; nausea, sleepiness and great weakness during and after meals; eructations may be sour, the taste bad, bitter or putrid, the tongue coated, offensive odour "like old cheese" from the mouth (which has, perhaps wrongly, been connected with stagnation in the bronchi); large stools difficult to evacuate, swollen hæmorrhoids. Weakness of the abdominal muscles and of the anal sphincter are likely to contribute to these digestive troubles.

The symptoms of Kalium carb. from the urinary and sexual organs are also subordinate to the general constitutional trend of the remedy. *Before and during the period many Kalium carb. complaints are aggravated,* in particular the sacral pains radiating into the thighs. The period itself may be either delayed or too early.

Once more we have, as observers, accompanied one of nature's agents on its errands. The normal working of potassium within the life processes had to be inferred chiefly from the disorders which potassium salts can provoke. We tried to discover the weak points susceptible to activities of Kalium carb. and are not surprised to find them where the cell-constituent potassium appears to have its most vital functions. The affinity to the neuro-muscular tissues, including the heart muscle, determines the universal trend in the sphere of actions; the normal constituent becomes a constitutional remedy only under very special conditions. Even in the most suitable preparation such a constitutional substance elicits a response only from susceptible persons. In provings, reactions can be expected only from a limited number of persons, viz., those who have the Kalium carb. disposition; which, however, would not become manifest without this stimulus. Nor can we expect those gross deviations from the norm which are associated with strong "poisonous" agents. A substance like Kalium carb. can serve but as a mild stimulus. The value of a medicinal

impulse does not, however, depend upon whether it is mild or strong, but upon the degree to which it suits the existing conditions. The amount of energy given in the stimulus may be infinitesimal in comparison with that supplied by the reacting organism; nevertheless the effect could be stronger than was desirable. It is the quality of the stimulus which counts first and foremost; and in therapy we have no better means of assuring this quality to be appropriate than by comparing the symptoms of the individual patient with the reactions of persons to potential stimuli and to apply that one which conforms most closely.

REVIEW

BEGINNER'S GUIDE TO HOMŒOPATHY

We have received a copy of the above book written by Mr. T. S. Iyer, B.A. and published by the Madras Presidency Homœopathinc Association, Price Rs. 7/8/- for review. The author does not possess any medical degree but while he was in service he studied Homœopathy and after his retirement he came to Calcutta and saw cases under the late revered Dr. W. Younan, M.B., C.M. (Edin.) for sometime and gained considerable knowledge about Homœopathy. In fact he is a famous Homœopathic physician in South India and has won great fame and name by his many splendid and miraculous cures. We have pretty carefully gone through the book and have found that the book "Beginner's Guide to Homœopathy" contains all matters pertaining to Homœopathy which have been very ably written. We are greatly indebted to Mr. Iyer for bringing out this book. In our opinion his book will be found to be a Vade Mecum of Homœopathy containing Hahnemann's law of cure, question of potency, Hahnemann's views about chronic diseases, a short materia medica of Homœopathic remedies and treat-