

## THE ROLE OF THE ADRENALS IN HEALTH AND DISEASE

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In some respects the adrenals are the most interesting and the most important hormone glands in the body. Bartolommeo Eustachio, who gave his not inconsiderable name to the Eustachian tubes, recognized the glands as separate entities in 1564.

For three hundred years they were of little interest to medical science until Dr. Thomas Addison wrote a paper in the *Medical Gazette* of 1849. Six years later he published in London a famous book called *On the Constitutional and Local Effects of Disease of the Suprarenal Capsules*.

In 1831 Dr. Richard Bright published a report on the condition later to be known as Addison's Disease. In 1856 Brown Sequard showed that excision of both adrenals invariably resulted in death, while Vulpian, in the same year, drew attention to a physiologically active substance, later to be recognized as adrenaline, and the French Academy offered a prize for the discovery of the duct in the Suprarenals.

In 1875 Greenlow described in his Croonian lecture over three hundred cases of Addison's disease.

In 1895 Oliver and Sharpey Schafer demonstrated the existence of a highly active pressor substance in the adrenal medulla. This was isolated by Takamini and Aldrich in 1901 in America, and thus adrenaline was the first hormone to be isolated.

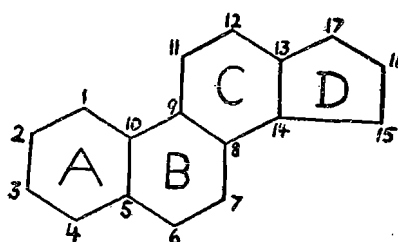
In 1895 Dr. Wm. Osler detected some clinical benefit after administering a glycerine extract of fresh adrenal glands to patients suffering from Addison's disease.

In 1929 Stewart and Rogoff demonstrated the physiological action of adrenal cortical extract and Swingle and Piffler showed anew its beneficial effects in Addison's disease.

In 1934 Reichstein in his Nobel Prize oration told how he purified one thousand kilograms and got eight grammes of highly potent, but still impure, material from the adrenals of the hog.

Reichstein, Kendall and Wintersteiner eventually isolated

twenty-nine steroid substances from adrenal cortical extracts. The chemical structure was gradually worked out and it was found to have a basic skeleton consisting of three six-carbon rings attached to a five-carbon ring.



Now this skeleton is important for it is common to the adrenal cortical hormones, the male sex hormones, the bile acids, the natural saponins and glycosides, cholesterol and its metabolites, the provitamins D, while the same chemical skeleton, without the substitute methyl group on ten, is present in the ovarian oestrogens. This linkage is remarked on in the Glaxo Volume 15, published in 1957, from which I have taken most of the foregoing facts.

This chemical relationship was also stressed by Dr. Frank Hartley, in his presidential address at the British Pharmaceutical Conference at Bristol in 1957.

At the risk of being thought a little egotistical I would remark here that the earliest article in print I have ever seen on this subject anticipates these official articles by fifteen years. This was my "Notes on Hormonic Variation", published in the *BRITISH HOMŒOPATHIC JOURNAL* of July 1942, Vol. 32, No. 2. Here I compared the remarkable similarity between the basic structural chemical formula of Ergosterol, Œstrin, Cholesterol and Methylcholanthrene. In this article I stated: "The important point one would like to make is that the present vogue of administering vitamin D in large doses to emaciated women may make them more prone to cancer, for there seems to be a close connection between growth and mutation of carcinogenic cells and the amount of Œstrin in the body." Last year the *British Medical Journal* drew official attention to this danger.

But to return to the evolution of cortisone. In 1941 a rumour went about that the German Luftwaffe was using adrenal cortical extracts to help pilots maintain greater efficiency. This rumour was false, but it meant that twenty-two laboratories in America were instructed to try for a synthesis of the steroids to increase their availability.

Herbalists for years have used Borage to help timidity, and it is interesting that Borage comes from an old Celtic word meaning Courage, and that Borage definitely seems to help the output of adrenaline.

In 1943 Dehydrocortisone was synthesized, and in 1945 Kendall and Mercks prepared several grammes of the steroid, but it was found of little use in Addison's disease.

In 1946 Sarette synthesized Cortisone, and a few grammes of this were produced by Merck's, using bile acids as the starting material.

These were commercial landmarks, however, and the year a physician wants to remember is 1948, when Dr. Hench, from the Mayo Clinic, noticed that rheumatoid arthritis apparently benefited in patients undergoing pregnancy, or who took attacks of jaundice. He came to the accurate clinical conclusion that some remedial agent must be generated in the rheumatic patient experiencing either pregnancy or jaundice. Cortisone became available to him at the end of 1948, and the results of Dr. Hench's trial of cortisone in rheumatoid arthritis were published in the Proceedings of the Staff Meetings of the Mayo Clinic in 1949. This paper made medical history, and stimulated the manufacturer to produce cortisone on a vast commercial scale.

The chemists had many problems to solve in their endeavour to increase supplies. They had to find a substitute with an oxygen atom attached to the carbon atom 11 on ring C. Only two natural sterols were known to exist with the troublesome oxygen atom already attached. One was Sarmenogenin, from the elusive seeds of *Strophanthus sarmentosus* and the other was  $\gamma$ -Bufogen, obtained from the skins of Chinese toads. You may well wonder how the chemists happened on the Chinese toad as a source of supply. Perhaps some chemist remembered that for centuries the Chinese had used powdered toad skins which they called "Senso"

for the treatment of heart disease, something in the manner in which we use digitalis today. Perhaps, however, some chemist remembered his Shakespeare, where the Duke says in "As You Like It":

"Sweet are the uses of adversity,  
Which, like the toad, ugly and venomous  
Wears yet a precious jewel in his head."

Shakespeare would be astonished if he could realize that his precious jewel is now recognized as Bufogen with the chemical formula  $C_{18}H_{24}O_4$ .

At this point I would draw your attention to the homœopathic provings of *Bufo*, which acts on the nervous system and the skin, though personally I have never found it of the slightest use. It is interesting theoretically to compare this remedy with *Strophanthus hispidus*, and consider their recorded provings in the light of the new knowledge that their base and cortisone are identical. Indubitably, some of these provings owe their origin to the cortisone-like action, and give confirmation to the accuracy of our early provers. Thinking along similar lines a homœopath might have explored the possibilities of alfalfa grass as a source of supply.

The manufacturing chemists succeeded in transferring the oxygen atom from  $C_{12}$  to  $C_{11}$  as in the synthesis from Hecogenin, which came from the juice of another grass called Sisal, which can be grown in vast quantities in East Africa. Sisal is now the main source of supply of cortisone and replaces all earlier sources.

There was a popular article called "Taming the Wild Hormones" by Paul de Kruif in the *Readers' Digest* of September, 1958. He shows how Hydrocortisone (which he calls strong but wild) can be illustrated by orange coloured HO at Carbon 11. He shows how chemists made an advance in hormone safety, by removing the hydrogen atoms from Carbons 1 and 2. This gives Prednisolone, three to five times more potent than hydrocortisone, and which has the advantage to the patient of taking away the side-effects caused by upsetting the water and salt balance. It also does not increase the blood pressure, though it can give patients

peptic ulceration, as could Histamine when first prescribed.

Commercial chemists then added Fluorine to the molecule at Carbon 9, but this disturbed the water and salt balance so much that it was abandoned. This defeat was turned into victory, however, when they succeeded in attaching an oxygen hydrogen atom to Carbon 16 in the diagram. This did not upset the water and salt balance and this new hormone, called Ledercort in America, was found to benefit greatly patients with rheumatoid arthritis; and it also helped any type of rheumatic patient who happened to have psoriasis.

I do not propose going further into the chemistry of the steroids at this stage. All I want to do is to stress the importance of the adrenals in modern medicine. All one requires to remember of their anatomy is their very adequate blood supply common to all ductless glands, and their intimate anatomical relationship with the stomach, the pancreas, the liver, the spleen and the kidneys and the great blood vessels. Another point apt to be forgotten is that accessory adrenal tissue can be found, like little yellow pin heads, within the abdomen.

For many years adrenaline alone was considered to be the active principle of the adrenal medulla, but Tuller and Hamberg demonstrated in 1949 that about 20 per cent of this vasoactive material was in fact noradrenaline. The presence of both hormones in the medulla is now an established fact. Indeed, noradrenaline is now supposed to be the chemical messenger that transmits impulses along the sympathetic nerve fibres. There is much speculation today how it is disposed of in the body.

Mescaline, the hallucination drug, perhaps inhibits the methylation of noradrenaline in the brain and so raises the concentration. Iproniazid may act the same way and produce euphoria. Reserpine may cause depression by a lowering of concentration, while Chlorpromazine may tranquillize by antagonizing noradrenaline in the brain. These are all matters of great interest at the moment.

Some of you may think I have spent too much time on the steroids, but cortisone is important. Bronchial asthma is now treated with hydrocortisone powder, chronic bronchitis with hydrocortisone acetate, fulminating pancreatitis with cortisone, while

they are even now trying out an oral contraceptive, Enavid, a derivative of progesterone, which has the same basic skeleton as other sterols. Noradrenaline is being used routine to raise the blood pressure after severe coronary attacks. The steroids also play an important part in regulating the permeability of cell membranes. One of the recent discoveries about the adrenals is that in adrenal insufficiency the composition of the faeces, the sweat, and the saliva changes in much the same way as does the urine. It has also recently been proved that in a tubular cell of the kidney in adrenal insufficiency, the potassium content is increased and the sodium content diminished, which goes some way to explain the mystery of the mechanics of oedema.

Some twenty years ago I gave Dr. Boyd's father the first book ever written about the permeability of cell membranes, and I suggested to him at that time, with all the arrogance of youth, that some homœopathic research into this subject would help us to understand how our minute doses worked.

At the present time orthodox medicine is engaged in a frantic endeavour to fit in all their outworn theories of disease to the latest discoveries resulting from steroid therapy, and they come to some very peculiar conclusions. They have not yet had the grace to acknowledge that cortisone has proved conclusively that a large amount of disease is dis-ease or disharmony, and that there has existed among medicals a small group called Homœopaths who have been proved right in sticking to their fundamental principle that disease is disharmony. The fact that the adrenals are now acknowledged as the great chemical harmonizers in the body should also convince any thoughtful prescriber that cortisone is a dangerous drug to push.

The result of these wonderful discoveries with cortisone has put orthodox medicine under a further debt to the research chemists in the great drug houses, who now literally lead the profession by the nose. This is just a phase however, and I am all for co-operation with the brilliant research chemists. For instance, the other week a patient asked me to make up that mouth wash "which always soothed his throat". This was a teaspoonful of calendula in eight ounces of water, and I there and then wrote to the chief

chemist in Glaxo and suggested they market same. He sent me a courteous reply which I have here.

What we homœopaths ought to do, and I have said this many times, is to employ a research organic chemist to prove the rationale of our system. He could show how the fundamental steroid molecule is present in such drugs as *Bufo* and *Strophanthus* and how our provings of *Lac. caninum*, *Conium* owe their effects to the steroid strain. He could also prove, for instance, how *Colchicum*, our meadow saffron, has certain points of similarity with ACTH, from the anterior lobe of the pituitary, which acts in conjunction with the adrenals.

Hormone therapy is the youngest child of medicine's *Materia Medica* and, as such, I think we should have some sympathy for this Benjamin in the family. The good old principles of Homœopathy will not, in my opinion, be swept away by the wonderful therapeutic advances made in the last few years if we make an honest endeavour to understand these advances, and to co-relate them with our own drug provings, which are surprisingly accurate even from a strictly chemical viewpoint.

Now let me, as briefly as possible, stress some of the salient features in this study of the adrenals, the gland of stress.

The cortex is the covering of the adrenals, absolutely essential for life. This covering contains the sterols, which are complex alcohols all containing three six-carbon rings attached to a fourth five-carbon ring. The steroids are a collective name for this group and the group includes the sterols, the bile acids, the sex and adrenal cortical hormones, the cardiac glycosides and the vitamin D derivatives. As far as is known they were first grouped together by a homœopath in 1942, before cortisone was synthesized.

This curious chap compared them with methylcholanthrene, a highly carcinogenic compound, which can be synthesized in the laboratory from deoxycholic acid, and which may or may not be the cause of lung cancer, from the excessive weight of hydrocarbons present in soot and cities.

The medulla, or middle of the adrenals, is essential to life. It produces adrenaline and noradrenaline, in the proportion of four to one.

Adrenaline is related chemically to tyrosine from the thyroid,

and it is useful in shock, collapse and hæmorrhage. It is a chemical cousin of ephedrine and benzedrine.

Noradrenaline is the most powerful vasoconstrictor known. It is the chemical which carries the messages along the sympathetic nervous system. Traces of the chemical can be found in the skin, the chromaffin cells of the heart and, indeed, in all mammalian tissue except the placenta.

I suggest again that some biochemist be employed by the Faculty to investigate our provings of various drugs to find out how much their action is due to the steroid molecule, which is known to exist in several of the drugs mentioned in this paper.

Potentized medicine must act on the cell membrane by altering the osmosis of the cell to such imponderables as gold, lead and mercury. A study of the permeability of cell membrane and of colloidal chemistry would, I feel sure, convince the scientist of the truth of the homœopathic approach to disease. In the adrenal glands and in the steroids we have the first definite clue of how our research should proceed, and where it would have some common ground with orthodox medical research.

Finally, from the practitioner's point of view, it is well to remember that adrenaline can abolish insulin convulsions in the diabetic patient. The steroids are also known to cause hepatic gluconeogenesis or the making of glycerine from fat. I mention these two facts here as to my mind this is proof that the hormone glands are all intimately connected. The above facts show the adrenals to be connected with the pancreas and liver and I have already said they are connected with the thyroid and pituitary glands.

But recently there has been discovered a new natural corticoid supposed to be manufactured in the adrenals. This has now been called Aldosterone, or the sodium-retaining substance. It can appear as a result of pathological changes in the adrenals due to tumours of the cortex, or to overactivity as in Cushing's syndrome. It can also occur as a result of hypertension or pregnancy in the patient.

When we think of all the careful research work being done every day into the physiology of the adrenal glands and the many facts known about them within the last decade, is it not a little



churlish of our homœopathic group to ignore this work entirely?

So far in this paper I have said nothing about the extreme chemical potency of the sterols, but they are worthy of your attention if only because a sterol such as Calciferol, more familiarly known as vitamin D, is of proved potency. Every homœopath should know that in Professor John Read's *Textbook of Organic Chemistry* (1948 edition) there occurs this sentence at the bottom of page 654: "Its extreme potency is apparent from the above table . . . one part in more than two thousand millions produces a detectable physiological effect in a rat."

In the table referred to on the previous page he says: "Somewhat similar to the hormones in their physiological effect and potency are the vitamins." To me at least this is sufficient proof of the validity of the homœopathic dose, and this scientific work should be familiar to all homœopaths.

—*The British Homœo. Journal, Oct., '59*

### TERTIARY STAGES AND LESIONS OF SYCOSIS

(Continued from page 449)

about an eighth of an inch long, but can be much shorter, are slightly coloured, brownish or greyish browns, pointed at the end and with spindle-like attachments. When they appear in children or young people, they are usually found about the eyelids and on the neck. Quite often they disappear spontaneously and some other tertiary lesion takes their place.

It can be stated with some certainty that when a tertiary eruption makes its appearance that a suppressed discharge cannot be reproduced—it has passed well beyond that stage—so that the disease, Sycosis becomes a slow and difficult thing to cure. Those innocent looking warts have a very chronic foundation in the organs that has to be removed, not the organs themselves, then the warts will disappear of their own accord. They will have nothing left to hold on to.

—*The Homœopathic World, Aug. '60*