

CAN SCIENCE HEREAFTER GROW GIANTS AT WILL?



Dr. C. E. de M. Sajous.

Recent Researches Seem to Point to the Pituitary Gland as Holding the Secret of the Size of Human Beings—Gigantism Is a Disease, Which May Be Artificially Produced.

MANY middle-aged and elderly physicians and surgeons in this city will recall the annual lecture of a certain famous professor of anatomy on the thyroid bone. It was very brief. Here it is: "D-n the thyroid bone!"

This summary dismissal of the offending bone probably was due to the fact that it is about as interesting an object as the common pretzel, and did not seem to be of particular importance to this distinguished professor.

Anatomists and physiologists of a score of years ago passed over some of the obscure glands of the body, a few of the so-called "ductless glands," with as little ceremony. They had only vague theories to account for the presence of these glands in the human body; they knew nothing positive about their functions, and said so; and thus it came about that hundreds of young doctors left college with nothing relative to those glands sticking in their memories except their names. Three of these are the thyroid gland, the adrenals, and the queer little morsel of tissue at the base of the brain called variously the pituitary body, the pituitary gland, and the hypophysis cerebri.

The last few years have witnessed a wonderful development in our knowledge of these glands. A decade ago it was generally believed among medical men that these were but the rudimentary organs of former rudimentary organs; to-day, thanks to the persistence of those whose field is experimental medicine and surgery, we know that these glands are extremely vital to life.

Surgeons may remove the stomach, a lung, part of the brain, and even the pituitary body, and the patients will recover; but if the diminutive gland, the pituitary body, is removed, death follows within forty-eight hours. It is reasonably certain, in the opinion of a large number of laboratory workers, that the secret of the growth of the body rests in this little gland.

What a range of possibilities this knowledge unfolds! A further development of surgical technique and chemical skill in the compounding of organic extracts, and by means of these producing a modification of the functions of the pituitary body, and who could say that we could produce a race of giants at will? In such a case there would be no necessity for resorting to the much-talked-of plan of selection described in our modern works on eugenics.

Fancy, for instance, the production to order of a regiment of soldiers each exactly six feet tall, or a group of eight-foot giants for the circus or museum. If the theory held by many is correct, this can readily be accomplished by stimulating the pituitary body to hyperactivity.

On the other hand, by diminishing the activity of the gland, we could arrest growth and produce a group of dwarfs. In other words, persons old enough to know just what height they wished to attain could have it regulated to order, or be "made to measure."

Prof. Arthur Keith of the Royal College of Surgeons in London, who is eminent as an authority on scientific subjects, delivered a lecture at the Royal Institution the other day, in which he declared that there was reason to believe that the secret of growth had been discovered. He is quoted as saying:

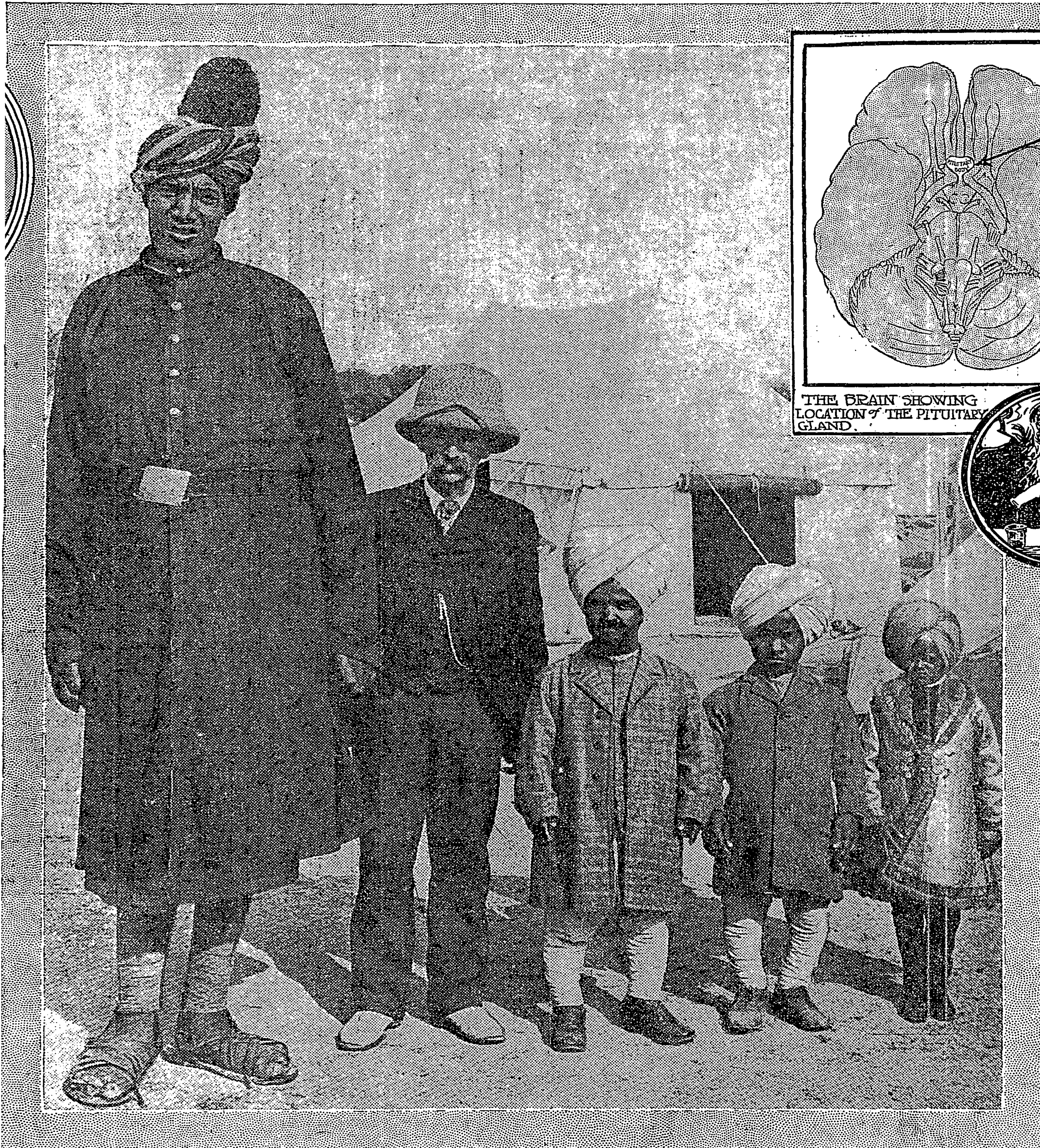
"So far, we have only unlocked the door of the unknown. We do not know exactly what the room will contain when we enter it, but we think that when we have done that we shall have the means of regulating the size and stature of the body at will. Modern research has proved that the growth of a giant is due to a diseased condition. Recent discoveries relating to the cause of gigantism have shown that the key to the growth was found in what is called the pituitary body at the base of the skull.

"It is a little thing which would not fill a teaspoon. It is smaller than a grape, and yet we know it to be a thing of very great importance. It was discovered by a French physician, Pierre Marie, who found, also, that in cases of abnormal growth this small body had enlarged. He jumped at the idea that it must secrete something which somehow affected the growth of the body.

"Now, it has been found that in the pituitary gland are secreted a number of liquid substances which are deposited in the blood. Possibly at a future date scientists may be able to extract that one unknown essential substance and by feeding the subject with it cause the growth to go on continuously. Now normal growth occurs in stages. There are weeks when a child stays the same size. This is followed by weeks when it grows, for the pituitary body is more active by fits.

"When the unknown secretion is too plentiful in adults it causes unusual stoutness, but in the young who have not yet finished their growth, an abnormal growth or gigantism results."

Then the speaker continued in a more whimsical fashion:



This photograph, recently taken in India, shows interesting comparisons in the heights of human beings closely allied. The huge man on the left is known as the Kashmir Giant and is 7 feet 9 inches in height. Next to him is Prof. Ricalton, who is responsible for the photograph, while the other three men belong to a diminutive race. The one on the extreme right is known as the Patiala Midget and is only 2 feet 4 inches in height. He is a perfect specimen of this type of the human race and is in no sense a dwarf, but conveys rather the impression of a small but otherwise well-developed man. An interesting fact is that this midget and the giant are both twenty-three years of age.

"Science, therefore, holds out the hope that people may not only be able to regulate their height, but beauty doctors may be able to work on strictly scientific principles.

"If a lady, for instance, did not think that her nose was symmetrical, a doctor could bring it to the shape required by means of a pituitary sandwich. In fact, the plainest people might be made beautiful."

Prof. Keith has either been misquoted or he is mistaken in saying that the pituitary body was discovered by Pierre Marie. The existence of the gland was recognized long before his day by anatomists, but its functions were unknown to the physiologists.

Let us inquire a little more closely concerning the pituitary gland and its sup-

posed functions. One investigator, Von Gehuchten, figuratively threw up his hands and called it "l'organe énigmatique." The name comes from the Latin pituita, meaning mucus. Webster's Dictionary, edition of 1907, calls it a gland of "unknown function."

The Standard Dictionary, edition of 1903, gives an adequate description of its anatomical relations and the theories of its identity maintained at that time, as follows:

"Pituitary body, or gland, a small rounded structure within the cranium, near the root of the nose, and attached to the base of the brain by a pedicle; now believed to be the vestiges of some aborted glandular organ connected with the ventricles of the brain, though former-

ly thought to secrete the pituita, or mucus of the nose.

The term hypophysis cerebri, used in scientific discussions of the subject, literally means "undergrowth of the brain," referring, no doubt, to the location of the gland. In an editorial on "The Hypophysis Cerebri," the editor of The Journal of the American Medical Association refers with pardonable pride to the fact that so large a portion of our knowledge of the physiology of the pituitary gland and of the symptomatology of its disease is due to work that has been, and is being, done in this country. And so we come to the classical oration on "The Hypophysis Cerebri" delivered by Dr. Harvey Cushing of Johns Hopkins University, Baltimore, before the American

Medical Association at Atlantic City. This contains a summary of practically all that is known concerning this important gland at the present time.

A notable feature of Dr. Cushing's oration is the statement that the pituitary, the thyroid, the adrenals, and others of the so-called ductless glands are correlated or inter-related. Here are some extracts from Dr. Cushing's address:

"A combination of clinical, experimental, and surgical experiences during the past twenty years has served to unveil many of the mysteries which formerly surrounded the functions of these structures, whose normal activities prove to be so essential to the maintenance of physiologic equilibrium. Myxedema, cretinism, exophthalmic goitre, surgical myxedema, and tetany

have never been of the best, (for one thing because many of the highest paid official posts were held by the former) and it was believed that if the natives had been allowed to have their own way in making the new Constitution. France would have been forced to interfere to protect her subjects and their interests, and interference would almost inevitably lead to absorption.

That trouble was temporarily, at least, avoided by handing over to officials appointed by the French Government the task of drawing up the Constitution. But even now there is possibility of danger, for the Monegasques are far from satisfied, and at a recent meeting at which they delegates, headed by M. Raymond, explained the terms of the draft Constitution, they censured the Prince and his advisers in violent terms and resolved to boycott the elections fixed for next May. Moreover, it has been discovered, so it is said, that the old régime owes France about \$1,000,000 more than it declared and paid over as the latter's share of certain customs duties.

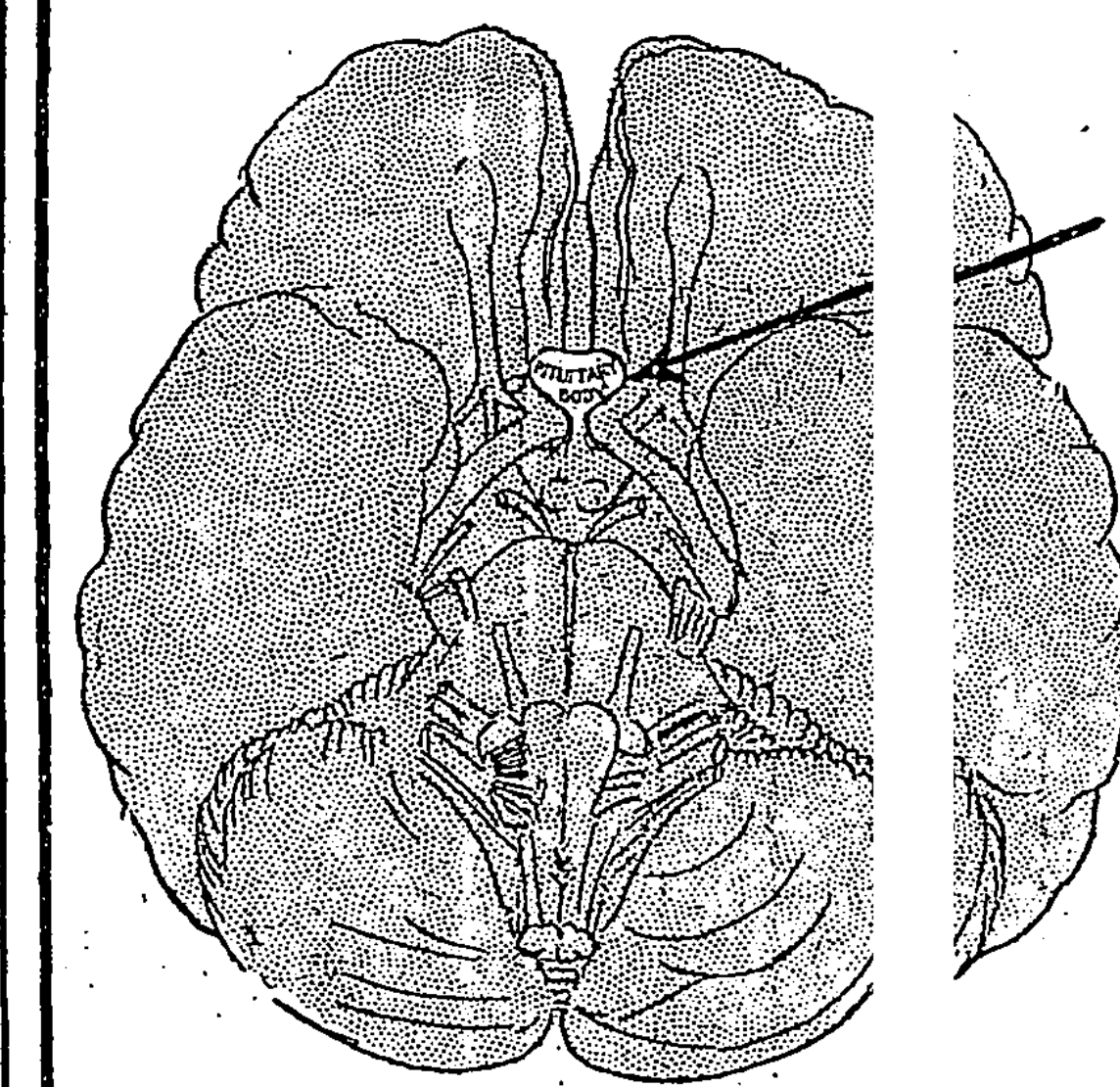
But France herself is almost as eager to avoid having to absorb Monaco as Monaco is to avoid being absorbed. France is too moral to countenance roulette herself, though "petits jeux," an infinitely worse game, is allowed; but she is ready enough to profit by the less stern morality of her little neighbor. Monaco, so to speak, is the pickpocket of Europe; France does not consider picking pockets respectable, but since a goodly share of the spoil comes to her, directly or indirectly, she would be very sorry to have to make herself responsible for Monaco, for then she could not allow it to pick pockets any longer. And so, unless the turbulent Monegasques are determined to kill the goose that lays the golden eggs, France will be forbearing and will not interfere a step further than she can help.

If the worst comes to the worst, however, and roulette is banished from Monte Carlo, the gamblers will not have to go far away for their amusement, for roulette is beginning to gain a foothold on the Italian Riviera, and a syndicate is now busy erecting a casino just across the frontier to the east of Mentone, for which they have already obtained a full gambling license from the Italian Government.

The Monegasques are naturally quite aware of this, and the "revolution" had nothing directly to do with the Casino, but as a matter of fact, Monaco was trembling in its shoes for a time last the Casino should be involved, and all danger is not yet entirely past. While nominally independent, the principality to all intents and purposes exists as a separate entity only by the mercy of France, which surrounds it on all sides except the sea. Many French subjects are resident in the State and a majority of the money invested there is French. The feeling between the French and the Monegasques

is a proportion much smaller than it would be if the various interests in Monaco were represented according to their importance. It is no exaggeration to say that the history of the principality is the history of the Casino, and that the roulette wheel is the hub of the State.

It is the Casino that has done it all, indirectly from the profits of the gambling and indirectly from the attractions provided out of those profits. Out of the 1-1/3 per cent, which the zero represents at roulette, and the 1/4 per cent, which the "refait" represents at a trente et quatre, the Casino pays annually to the



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Dr. S. J. Meltzer.

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It was found that young dogs survive the total loss of the gland longer than older dogs; but total removal of the gland undoubtedly does lead to death following a peculiar train of symptoms. The question that Dr. Cushing asks is this:

"Does this property of maintaining the physiologic equilibrium reside in the anterior or the posterior lobe?"

He replies by saying that no particularly characteristic symptoms appear to follow the loss of the entire posterior lobe. On the other hand, the removal of a part of the anterior lobe, (causing a diminution of secretion), though not incompatible with life, leads to profound alterations—notably an increase of fatty tissue in the body. The problems relating to bodily growth are matters, he believes, associated with the function of the anterior lobe. It is impossible to remove the gland, he says, without producing marked alterations in all the other ductless glands. Moreover, if the anterior lobe is entirely removed, the animal soon dies.

Acromegaly is a disease marked by grotesque enlargements of the bony structure of the body, particularly of the extremities and lower jaw. It has been demonstrated that tumors or glandular enlargement of the pituitary body often accompany this ailment. Dr. Cushing concludes, however, that the excess of bony development results from over-secretion of the pituitary body. This he deems to be partly proved by the fact that symptoms of acromegaly have subsided after part of the pituitary gland has been removed, causing under-secretion. Acromegaly, which occurs in the adult, is held to be delayed or abnormal gigantism. The latter, that is "normal" gigantism, commences in youth, and if Cushing's theory is the correct one, it results from over-activity of the anterior lobe of the pituitary body.

It can be readily understood, therefore, that as a result of further experimentation and the acquisition of new knowledge concerning the conditions of the matter of stimulating the pituitary to over-secretion, with a resulting increase in growth, which can be regulated at will. On the other hand, abnormal growth may be arrested and the condition of those suffering from acromegaly and tumors of the pituitary may be improved, or the disease may be cured.

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THE MONACO "REVOLUTION" THAT STEERED CLEAR OF ROULETTE

WHEN it first appeared in the news that there had been a "revolution" in Monaco, and that Prince Albert had granted his people a constitution, the first feeling aroused was of surprise that a little place like Monaco, the smallest independent State in the world, should have so big a thing as a constitution, and secondly of sympathy for the people who wanted to be in fashion and have a revolution, which, in any case, it was natural to suppose, could not make much difference. But, if the birth of this tiny constitutional State is not a matter of deep interest to various students of European politics, the story of its conception and bringing forth should make, when finally complete, one of the most amusing and interesting footnotes to history. Also, if some of the local prophets are right in their gloomiest forebodings, there is a possibility of Monte Carlo ceasing to be the powerful magnet it now is for American and English pleasure-seekers.

Here, to begin with, are the bare facts, the sober historical account of what has happened. Up to about twenty months ago Prince Albert of Monaco was an absolute autocrat. He had a council of advisers, but by the law of the land these were only advisers; he had the power. However, the Prince, not having the instincts of an autocrat and being much more interested in science than in the affairs of his principality, left most of the business of governing to them. Then the people, inspired apparently more by the idea of progress than by any real or fancied discontent, thought they ought to have a municipal council. They asked for it, and the Prince, without hesitation or misgiving, let them have it.

Then, about a year ago, there arose the sudden demand for a Constitution. Prince Albert thought they were greedy and refused. This roused them to a state of progress than by any real or fancied discontent, thought they ought to have a municipal council. They asked for it, and the Prince, without hesitation or misgiving, let them have it.

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For a Time the Tiny State's Principal Industry Was in Danger, But Now It Seems Safe.

Prince Albert was then in Paris, and he was probably not intimidated by the threats, or even by the whispers of "bombs," but acting on the wise principle that half a loaf is better than no bread, he capitulated and sent an urgent wire to his son, Prince Louis, to announce that he had graciously granted a Constitution to his well-loved and faithful subjects. The well-loved and faithful thereupon withdrew to decorate the town, swearing undying loyalty and devotion to their noble Prince.

The next business was to draw up the Constitution, now that they had it. The task was handed over to two jurists appointed by the French Government, to whom the delegates of the people explained what they wanted, and the nominee of the Prince, what he wanted. The result of their labors was published in January.

Whether it will please the revolutionaries remains to be seen, but they have had pretty strong hints that it is all they will get. The Constitution as drawn up provides for a Council of State, composed of three Ministers, to help the Prince to rule, and a national council, or Parliament, of twenty-one, elected every four years by universal suffrage. This body will meet twice a year, and its sessions will each last a fortnight at the longest. The Prince will introduce and sanction, and may be asked by the council to propose legislation. Thus the people have got their Parliament; who will be top dog remains to be seen.

The Tom Paine and Washington combination of Monaco is M. Raymond, a stout "avocat," not prepossessing in appearance, but undeniably clever and a very persuasive speaker. Being particularly good at getting clients out of tight places, he had a very big practice in Monte Carlo, and through it immense influence.

Now, about eighteen months ago there was a difficulty between Prince Louis and his father, who wanted to disinherit his son in favor of a German cousin. M. Raymond acted for Prince Louis, and through this discovery that things were

very far from right in the balance sheet of the principality. He discovered, for instance, that there was a matter of \$400,000 missing from the princely coffers, which, according to the known revenue and declared expenditure of the Prince, ought to have been there. He also found out the reason, so he said, why the cathedral and port of Monte Carlo have been so long in constructing. The capital amounts set apart for these had gone into the Prince's account, and only the interest was being devoted to the works.

Primed with these discoveries, he set to work to rouse the people. It did not take long. The revenues were undeniably being mismanaged, and the Prince's advisers were neither trusted nor popular. On Prince Albert himself, it should be said, suspicion was not cast. Raymond's discoveries and his clever tongue soon gathered the whole Monegasque population to his side, and so the "revolution" was brought about.

It used to be thought that Australia took her politics pretty seriously, having a full equipment of governmental machinery for every three-quarters of a million inhabitants, but that is nothing to a Parliament and legislative and executive for 1,422 citizens and 450 electors. And, finally, of these 448, 333 are naturalized, which makes a grand total of 95 native Monegasques who, all being well, will go to the polls next May.

At least thirty of the ninety-five are croppers. Which, as a matter of fact, is a proportion much smaller than it would be if the various interests in Monaco were represented according to their importance. It is no exaggeration to say that the history of the principality is the history of the Casino, and that the roulette wheel is the hub of the State.

It is the Casino that has done it all, indirectly from the profits of the gambling and indirectly from the attractions provided out of those profits. Out of the 1-1/3 per cent, which the zero represents at roulette, and the 1/4 per cent, which the "refait" represents at a trente et quatre, the Casino pays annually to the

State \$6,000,000, practically its entire revenue, and thus provides for everything—public works, roadmaking, police, schools, churches, charities. They have no rates and taxes to pay in Monaco.

The Casino also maintains two of the finest orchestras in Europe, and a theatre so good that some composers, Massenet included, prefer to have their new plays produced there rather than in Paris. It subsidizes generously anything that will add to the attractiveness of the place, and is now, for instance, spending a quarter of a million in laying out a golf course near by. Incidentally it may be remarked that, besides doing all this, it last year managed to put aside more than \$5,000,000 for the benefit of its shareholders.

From this it may fairly be concluded that gambling is of infinitely more importance to the principality than politics, and the proper management of the Casino than any particular form of government for the tiny State. Nobody, of course, likes being "done," and if their former rulers were really distributing the kindly fruits of the roulette wheel according to their own will and pleasure than a strict regard for honesty would allow, they were not unreasonable in wanting a change. But, after all, the palace, the Municipal Council, the new National Council, and the rest are nothing but appendages to the Casino, and it doesn't really matter much to Monte Carlo whether the Prince and his advisers do as they like or the croppers and cab drivers have a Parliament.

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