

advantages of this representation are obvious.

This system of representation is elastic and any other data of importance could be associated with the index by appropriate number or alphabet. Thus the influence of climate can be incorporated with the soil index showing the textural composition. It has been shown in this laboratory that Meyer's factor, viz., rainfall divided by absolute saturation deficit of the air, the latter being given by the formula:

$$100 - \text{Relative humidity}/100 \times \text{Mean vapour pressure (m.m.)}$$

calculated from the meteorological data of research stations distributed all over India brings out the climatic variations and conforms with the climatic classification for soils into arid, semi-arid, humid, and per-humid zones. If this single value climatic factor is associated with the numerical index of soil texture the information conveyed by the index is greatly augmented. For associating the Meyer's factor it is modified by rounding to the nearest ten and eliminating the last zero so that brevity, so essential in such numeric representation, could be maintained.

In addition to the association of Meyer's factor with the index, the colour classification of the soils can also be associated likewise. Without attaching much importance to fine variations, the soil colours may be classified into the following groups, of which the initial letter or letters may usefully be associated with the numerical index: (1) Red (R), (2) Black (B), (3) Grey (G), (4) Brown (Br) and (5) Yellow (Y).

The following table gives the results of analysis of a few typical soils from various research stations together with an expression, in the last column, of these results by the above nomenclature. It may be seen that the comparative evaluation of soils is made simple by the adoption of the proposed system.

Locality	Aggregate analysis			Meyer's factor	Soil index
	Sand	Silt	Clay		
<i>Black soils—</i>					
Akola	39.6	40.4	0.0	141.4	R. 442.14
Labhandi	34.6	48.6	16.8	237.2	B. 352.24
Hagari	39.6	32.8	27.9	91.3	B. 433.09
Padegaon	35.2	38.4	26.4	132.3	B. 443.13
<i>Red soils—</i>					
Ranchi	60.2	31.7	8.1	318.1	R. 631.32
Taliparamba	52.1	31.3	16.6	753.9	R. 522.75
Coimbatore	67.2	20.0	12.8	162.0	R. 721.16
Sirsi	2.7	21.8	5.5	666.5	R. 721.67
<i>Grey soils—</i>					
Delhi	72.9	19.6	7.5	123.7	G. 721.12
Kangra	59.5	34.8	5.7	676.0	G. 631.68
Shahjahanpur	81.6	15.6	2.8	205.3	G. 820.21
Karimgang	40.6	51.6	7.8	132.8	G. 451.13
Chinsuri	18.6	62.8	8.5	426.6	G. 202.43
Samalkot	65.9	23.4	10.7	223.0	G. 721.22
Tabiji	90.2	7.4	2.4	110.2	G. 910.11

It is possible, on the same basis, to work out chemical indices for soils. Thus a soil containing 42 mgm. of N, 54 mgm. of P₂O₅ and 200 mgm. of K₂O could be represented by N₄P₅K₂₀, which would be a very suitable index for comparative purposes. Similarly, values for soil reaction and exchangeable bases can also be suitably abbreviated and added to this index wherever these values are known to influence crop yields.

The system of notation suggested here can be improved upon or modified to suit the individual problems of the soil surveyor. An agreed notation on these lines would greatly help in comparative soil studies and ultimately in all soil-crop relationships.

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MANUFACTURE OF GLAND PRODUCTS

THE interesting article by Prof. B. B. Dey and his associates¹ has brought out much useful information which has a bearing on the utilisation of gland products under Indian conditions.

We have collected considerable amount of data bearing on the utilisation of pituitary and other glands, but owing to certain technical considerations, we are precluded from publishing all the related details.

PITUITARY GLAND

During the past fifteen months, we have processed pituitaries from about two lakhs of animals. We have further built up an organisation which is now dealing with a number of slaughteries and is handling about 20,000 glands per month.

We have concentrated chiefly on the beef glands, which are the only ones of practical value, particularly for the manufacture of post. pituitary powder. In our experience, the average weight of the glands varies from place to place in India, being dependent on the size of the animals which, in turn, is dependent on soil and climatic conditions. Thus, in a Western India centre, the average pituitary weighs over 2 grams, whereas at a South Indian centre, glands weighing less than 0.8 gram each are obtained. Irrespective of the location of the centre, one occasionally comes across a gland in which either the posterior or the anterior lobe preponderates.

In actual production, the average ratio of the separated posterior lobe to the residue (chiefly representing the anterior lobe) works out to about 1:5. This is largely because some of the posterior lobe is left behind in the dissection. A certain amount of skill and speed is required in the manipulation because, after some time, the line of demarcation between the two lobes becomes rather blurred.

Experience has shown that a great deal of the earlier theory and practice in regard to the handling of the gland material, as also some of the concepts in regard to the stability of the hormone components, require revision. The active principles are comparatively stable, but there is apt to be much loss in handling. It is

particularly so when the gland materials have to be transported from one centre to another.

The final yield of the post. pituitary powder is determined by a number of factors including the skill of the operation. In some centres about 70 glands are required to yield one gram of the finished powder, while at others, even 25 to 30 glands are sufficient to yield the same result. The practical success would naturally depend on obtaining as favourable a ratio as possible.

We have carried out numerous assays on the products prepared by us. Practically every batch has been found to conform to the new International Standard. Our results have been independently confirmed by our colleagues at other centres. We can now state, with a certain amount of confidence, that, with necessary care and control, a product conforming absolutely to the new International Standard can be produced on a large scale in India.

THYROID GLAND

We have processed useful quantities of beef as well as sheep glands and have supplied the material for certain emergency requirements. The process offers no difficulty. The final product which was derived exclusively from one centre was found to contain about twice the amount of iodine (in combination as thyroxine) as that prescribed according to B.P. Standard. This may not, however, apply to other centres, so we refrain from generalising on this point.

The use of the thyroid in medicine is limited and the average medical practitioner seldom prescribes it. Fairly large quantities of the desiccated gland are, however, being prepared in different parts of the world (as also in India) and the major part of this material as also other whole gland materials go to make up certain rejuvenation remedies of a doubtful value.

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1. *Curr. Sci.*, 1944, 13, 35.

ADRENAL GLANDS

We have been primarily interested in the production of *l*-adrenalin and have concentrated chiefly on beef glands as being of practical value. We have handled about 50,000 glands at one centre with a view to standardising the method of production.

We have occasionally found the absolute adrenalin content to be as much as 3 mgm. per gram of fresh tissues, but the average is about the same as that stated by Prof. Dey and his associates. Our earlier average yield was 1.8 gram per kg., but by improving the method of extraction, we have lately been able to raise it to 2 grams. The products prepared by us have been assayed by us and independently by a colleague at another centre and found to conform (within limits) to the standard.

There has been a certain amount of controversy regarding the relative merits of natural and synthetic adrenalin, with a strong section of medical opinion in favour of the former. From the economic point of view it is usually assumed that the natural product cannot hope to compete with the synthetic one, but this opinion is not justified. If the glands can be obtained at a reasonable price, adrenalin from the gland can be made at a lower cost than by synthetic method. Apart from the usually well-known precautions to ensure the stability of the hormone, effective extraction from the glands is an important factor determining the success.

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UPPER JURASSIC MARINE ALGÆ FROM TRICHINOPOLY, S. INDIA

THE discovery of *Solenopora* in the Cullygoody limestone was reported by me on a previous occasion,¹ and two species, *S. jurassica* Nich. and *S. coromandelensis* S. R. N. Rao were figured and briefly described. A detailed account which has since been completed is now ready for publication. The marine flora recorded is a small one, but of exceptional interest; for the first time, it establishes a Jurassic horizon in the Trichinopoly area; and it has an important bearing on the age of the Upper Gondwanas of this region. The species present are listed below and the stratigraphical results arrived at briefly discussed.

The genus *Solenopora* has world-wide distribution and its range is from the Ordovician to Jurassic.² The Cullygoody algae provide critical evidence for an Upper Jurassic age; they are very similar to marine floras from the Jurassic of other parts of the world.

The plants as a whole are definitely archaic; the algal vegetation of the world took a modern aspect in the Lower Cretaceous when true Corallinaceæ (with *Archæolithothamnium* as the earliest representative) first appeared—shortly after *Solenopora* and other ancient genera had become extinct.

Besides the algae, thin sections of the limestone occasionally show indeterminate fragments of a land plant and some arenaceous foraminifera. The latter consist mostly of *Choffatella* whose age is Lower Jurassic to Lower Cretaceous.

It is interesting to note that a Jurassic alga (*parachætetes*) has already been recorded by Dr. Pia from the Danian Niniyur beds of the Trichinopoly area.³ This genus is not known to have survived the Upper Jurassic in other parts of the world. I have some reasons to believe that it is a derived fossil in a Danian matrix; palæontological anachronisms of this kind are frequent in the Trichinopoly area.

The Cullygoody limestone⁴ is correlated with the Coral reef limestone (the basal member of