

Auriferous Tracts of Hyderabad State.

[IN South India, the ancient rocks, known as the Dharwar Series, noted to be the home of gold, occur in narrow almost parallel bands with a general N.N.W. trend and recognised by MacLaren under five main runs, of which the easternmost are particularly auriferous.

Some of them are represented in the Raichur Doab of the Hyderabad State, with which other parallel bands and patches also occur. The more important of them are the Maski band, the Kushtagi band, the Raichur band, the Gadwal band, and lastly the Ginigera patch.

Of these, the Maski band and the northern portion of the Raichur band are particularly known to be auriferous.

The Maski band of auriferous Dharwara is a long narrow tapering run, essentially consisting of hornblende and trappoid schists in the northern portions, the southern being chloritic. Numerous runs of blue quartz veins are associated which carry gold in them. This band is about 40 miles long extending from near Salgundi, north of Thungabhadra, in the south, right across the Doab, upto Gurgunta, south of the Krishna, in the north, having a width varying from about 14 miles in the north, to hardly about half a mile in the extreme south, and covering a total area of about 240 sq. miles.

This band, riddled with numerous old workings for gold, dating as far back as proto-historic times, may conveniently be divided into two zones, viz., the northern Hutti-Wondalli and the southern Maski-Udhal areas; the main old workings in the former being located at Hutti, Wondalli, Toppaldoddi and Uti and in the latter at Buddini, Maski, Togaldinne and Udhal.

The northern extension of the Maski band, north of the Krishna River, is known as the Mangalur band where old gold workings have also been noted. It is significant that this auriferous Maski band with its northern extension, the Mangalur band in the Gulbarga District, lies in the same trend with the auriferous Kolar schist belt, being also similar to it in character and composition.

The presence of numerous old gold working sites in such auriferous areas only suggests that these have been extensively worked by the ancients and all surface indications exploited. So, it seems that the only chance left for the modern prospector is to unbottom the old workings and continue beyond the depth reached by the ancient miners, who apparently had to discontinue due to influx of water and other mining difficulties which they could not cope with.

The field has received wide attention by prospecting companies. More than 300 old gold working sites have been discovered, and the possibilities of some of them explored. Gold mining at Hutti was conducted for 16 years during which time it paid substantial dividends, but the operations had to be closed down after the Great War in 1920 before its potentialities could be fully explored.

In view of the encouraging results obtained during the revision survey and prospecting work conducted by the Hyderabad Geological Department, it is hoped that with the encouragement given by the Government, the gold fields in the Raichur Doab will soon receive the attention they deserve and will result in the revival of gold mining industry in the State.

L. S. KRISHNAMURTHY.

SCIENCE NOTES.

Discovery of a New Garnet.—Details are given of the detection of a new magnesia-iron garnet in a paper contributed by Sir Lewis Fermor recently to the *Records of the Geological Survey of India* (Vol. 73, Part I).

It was suggested by Sir Lewis Fermor in 1912 that the curious bodies known as chondrules found in so many stony meteorites must once have been garnets. The suggestion was based on an examination of the meteorite which fell at Khohar in the Banda District of the United Provinces in 1910.

Since this hypothesis was propounded in 1912, no other, says Sir Lewis Fermor, has come to notice that offers an explanation more plausible or as satisfactory and consequently it can still be regarded as suitable to explain the formation of chondrules, and therefore of chondritic meteorites. The garnet adopted for this hypothesis was one that was not introduced to science at that time, consisting as it did, of a mixture of two previously unrecognised garnet 'molecules'. One of these garnet 'molecules' has since been detected as a constituent of certain Indian

garnets, and of a garnet from Glen Skiag in Scotland and named *skiaqite* after the Scottish locality.

If there was any foundation to the garnet hypothesis of the origin of chondrules, it was felt that it should be possible to discover analyses of garnets that could be interpreted satisfactorily only on the assumption of the presence of another garnet molecule.

This has lately been found in an occurrence of a deep brownish red garnet from a garnet diopside nodule from the Jagersfontein diamond mine in South Africa by the late Dr. Percy A. Wagner.

Sir Lewis Fermor has named this garnet 'khoharite' after the Khohar meteorite which was the starting point of his hypothesis. It would have been named after Dr. Wagner but for the existence of another wagnerite named after an earlier Oberberggrath Wagner.

Geological Work in 1937.—The Annual Report of the Geological Survey of India for 1937 records activities in several directions ranging

from water supply till gold prospecting. Important geological information has been obtained by the Officers of the Department, who accompanied the Sino-British Boundary Commission in the Wa States and Shaksgam Expedition to the Karakoram under the leadership of Mr. E. Sipton.

At the headquarters in Calcutta re-arrangements in the laboratory were completed in order to cope to the best advantage, with the large number of enquiries received during the year. Rearrangements in the fossil galleries and other museum specimens have been carried out with a view to increasing their popular appeal. Economic enquiries were conducted on bauxite, coal, gold, iron ore, clays and building materials at several localities.

The Department's advice was sought on engineering schemes such as the preservation of Elephanta Caves, the Malakhand Hydro-electric Scheme and power for Hazara District. The large number of fossil specimens collected during the year were examined by Indian and Foreign specialists and the results of their investigations were published in *Palaeontologia Indica*.

Crops without Rain.—The Imperial Council of Agricultural Research is making a series of experiments in what is called *Dry Farming*, a method which has been applied with great success in America, especially in Utah. Five stations in different parts of India have been established in different stages of experimental development under the supervision of a co-ordinating committee. The Committee has a task of standardising the methods and co-ordinating the results of all the stations.

By dry farming methods it is estimated that twice as much can be grown as by wet cultivation, without increasing the cost of production. This method requires a little more labour which is easily compatible under Indian conditions, and demands conservation and proper utilisation of subsoil moisture. Among other items of investigation, mention may be made of soil survey studies in plant physiology, preservation of water under different conditions and the effects of deep and shallow cultivation on the absorption of rain water, inter-culture of crops, the value of bunds in conserving rain water, the effects of varying the seed rate and farm-yard manure and different rotation of soil moisture and crop yield.

These dry farming experiments have now reached the third year of the five-year programme and results obtained so far are promising.

Temporary Seismic Equilibrium in Northern India.—In the year 1937 Burma and Northern India experienced earthquakes and it has been reported that there were 82 shocks in all, of which North-Eastern India and Burma received the largest number and North-West India was not spared. In peninsular India the number was negligible.

Dr. Coulson in an article contributed by him to the *Records of the Geological Survey of India*, 73, Part I, has reached the conclusion that

the region between the North-West Himalayas and the Hindukush has attained a temporary equilibrium. According to him the observers' reports indicate that the epicentral region of the severe shock which occurred on Sunday, 14th November 1937, was in the Hindukush Mountain near Drosh in Chitral. The instrumental records of the shock received from Agra, Kodaikanal, Kolaba and Alipore, indicate that the shock had a very deep focal depth of 200–240 kilometres. This is in agreement with and confirms the views of Dr. Coulson regarding the shock of the 1st February 1929, in the North-West Himalayas.

After a critical investigation, Dr. Coulson thinks that the shocks in North-Western and North-Eastern India must have had different epicentres and the temporary equilibrium after the earthquake of the 14th September 1937 will last till the accumulated stresses are again relieved, either by a sudden shock or by a shock heralded by a succession of four shocks.

Saving Wastage of 60,000 Bales of Cotton.—Anything up to 60,000 bales or 10,000 tons of cotton are, it is believed, largely wasted in this country in the form of cotton linters.

Cotton linters are the short fibres left when the cotton is ginned with a saw gin. They are $\frac{1}{8}$ of an inch and are nearly always allowed to go to waste. In roller ginning these linters are mixed up with cotton and sent to the mills. When this cotton is spun they fall out and are again wasted.

The Indian Central Cotton Committee has been carrying on experiments in the first stage of artificial silk production by the *acetate process* and is determining the cost of producing chemical cotton, *i.e.*, purified cellulose made from cotton. The experiments are carried on at the Cotton Committee's Technological Laboratory in Bombay. Given the cost of production of the basic material, chemical cotton, an industrialist can calculate the cost of rayon manufacture.

The other basic material used in the production of artificial silk is acetic acid. Experiments are being carried out at the Imperial Institute of Sugar Technology in Cawnpore which is studying the cost of production of acetic acid and acetic hydride from molasses of which there is an abundant supply in India.

Both cotton linters and molasses are materials that are available in this country and their use would be a valuable addition to the country's wealth.

The Corrosion of Tar Stills.—The Department of Scientific and Industrial Research has pointed out ("Chemistry Research Special Report" No. 4, I.L.M. Stationery Office, 9d. net) that decomposition of ammonium salts present in the aqueous liquor normally associated with tar was responsible to some extent for the corrosion of stills, but it was also agreed that some organic constituent or group of constituents in vertical retort tars was mainly responsible for the damage. Accordingly, the objectives of the investigation were:

(i) to identify the compounds or groups of compounds responsible for corrosion; (ii) to devise methods for the removal of such compounds or for the inhibition of their harmful action; (iii) alternatively, to discover a metal or alloy which would resist attack or to develop a protective coating for the mild steel in general use as constructional material for tar stills.

After an exhaustive examination of a long series of tar fractions, the following conclusions were reached:—The corrosive effect of neutral and basic constituents was negligible but at high temperatures, resinols or petroleum insoluble phenols were very active in promoting corrosion, and in the presence of ammonium chloride the activity of these materials was intensified. The more volatile phenols were not corrosive, a fact which is confirmed in industrial practice where tar acid stills have a very long life. Resinols are defined as those non-crystalline portions of tar soluble in caustic soda and precipitated from solution in an organic solvent by addition of light petroleum. In a crude form they are isolated as a viscous pitch but they can be purified to the condition of a brown amorphous powder. Low temperature tars are particularly rich in resinols, whereas coke oven and horizontal retort tars are almost devoid of such components. Vertical retort tars occupy an intermediate position with respect to this content of resinols. Further examination of the whole range of resinols revealed the fact that the portion soluble in benzene was much more corrosive than the insoluble part, probably owing to the circumstance that the latter, being highly polymerised, is almost inert. Confirmation of the conclusion that the corrosive effect of any tar is dependent chiefly on the content of benzene-soluble resinols was obtained by comparative distillations of four tars.

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The Cause of Cancer.—David Brownlie has, in his recent book, described a new theory of the primary cause of cancer and any discovery of the cause of cancer would unquestionably be one of the greatest contributions to the happiness of mankind. Any new thesis with scientific basis must demand the most careful investigation. Mr. Brownlie, a highly experienced fuel technologist and organic chemist, has during many years of consideration formed the opinion that the primary cause of cancer is the action of poisonous organic products resulting from the decomposition under high temperature conditions of carbonaceous materials, especially bituminous coal—and also petroleum oil used in the manufacture of carburetted water gas.

It has long been known, particularly in connection with the briquette industry, that coal tar pitch is definitely cancer-causing; and in research work the more usual method is to give cancer to mice by painting them with coal tar.

According to this new theory traces of these cancer poisons are present not only in coal tar and its fractions, but also in most towns gas, as delivered to the consumer. Another primary cause of cancer is the eating of smoked food such as meat and fish that has been suspended for a long time in smoke from a fire, generally wood. It will be appreciated that this is

a provocative book, but the author presents much evidence in support of his theory which calls for immediate investigation. He gives in this volume, a clear description of the many problems connected with cancer which will prove of vital importance not only to the medical profession, but also to industrialists and the general public.

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International Institute of Agriculture.—The Permanent Committee at its ordinary session held in March, with Dr. J. J. L. van Rijn, delegate of the Netherlands and of the Netherlands Indies and Vice-President of the Institute, in the chair, unanimously elected Baron Giacomo Acerbo, delegate of Italy, the retiring Chairman of the Permanent Committee, as Chairman for a further period of three years.

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International Forestry Centre in Berlin.—The Permanent Committee of the International Institute of Agriculture, in its session of March 1938, resolved to set up an International Forestry Centre in Berlin and, according to the terms of the constitution adopted at the same session, affiliated to the International Institute of Agriculture.

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The Entomological Society of India.—At a meeting of the Society, held in New Delhi, on May 18, a resolution was passed placing on record the members' deep sense of loss and sorrow at the death of Mr. Edward Meyrick, F.R.S., a recognised authority on microlepidoptera who had ungrudgingly identified microlepidopterous insects sent from India during the last 31 years.

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Indian Physical Society.—At the ordinary meeting of the Society held on Saturday, 30th April, in the Physics Seminar, University College of Science, Calcutta, with Prof. D. M. Bose in the chair, the following were elected Fellows of the Society:—(1) Dr. C. W. B. Normand, (2) Dr. N. Ahmad, (3) Dr. H. J. Taylor, (4) Dr. B. C. Mukherji, (5) Dr. Swami Jnanananda, (6) Mr. Kartick Chandra Mookherji, (7) Mr. Asoke Kumar Bose, (8) Mr. Mriganka Sekhar Sinha, (9) Mr. Haripada Sen.

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Discovery comes to Cambridge.—It will be remembered that this excellent popular journal of scientific knowledge was originally founded just after the War, for the purpose of disseminating the results of scientific investigations among the interested lay men. The original Trustees, Sir J. J. Thompson, Sir Frederic Kenyon, Sir Albert Seward and the late Professor R. S. Conway were men who had not only built up great bodies of scientific knowledge but have been the foremost leaders of scientific thought. They felt it their duty to help others to share in the pleasure of understanding the great advances and achievements of science.

Now the Trustees have made over their responsibilities of conducting the journal to the Syndics of the Cambridge University Press. We have no doubt that under the new auspices the journal will receive a fresh impetus and enrich the original principles and purpose for which it was founded. This journal embraces practically all fields of

scientific knowledge, and in its power of popular representation it occupies a foremost place in the ranks of popular scientific journals.

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Dr. T. S. Wheeler, D.Sc., Ph.D., F.Inst.P., F.I.B., F.N.I., M.I.Chem.E.—We have pleasure in offering our congratulations to Dr. T. S. Wheeler, Principal of the Royal Institute of Science, Bombay, on whom the Senate of the National University of Ireland have conferred the degree of D.Sc. Dr. Wheeler's Scientific work has secured for him a distinguished place in the world of science. His charming manners and lovable personality have won for him a large body of admiring friends.

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Mr. K. Ramayya, M.Sc., has received M.B.E. in the King's Birth Day honours and his numerous friends will rejoice at the decoration conferred upon him. His work as a Botanist in the Agricultural College, Coimbatore, has been an impressive record and we felicitate Mr. Ramayya on the appreciation of the Government of India of his contributions to science. He has been selected to act as Director of the Institute of Plant Industry, Indore, where his knowledge and experience which he has gathered as Paddy Expert, will be of great benefit in enlarging its activities.

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The British Association.—We understand that at the invitation of the British Association, the Indian Science Congress has deputed Rao Bahadur T. S. Venkataraman, C.I.E., Dr. B. C. Guha and Mr. W. D. West to attend the forthcoming session at Cambridge as representatives of India. We hope that the visit of scientists from Great Britain lately begun, will become an annual practice from which much good may be expected to result.

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Andhra University: Degree Course in Pharmaceutics.—Complete provision has now been made for the training of Pharmaceutical Chemists on the most modern lines. The analytical and manufacturing laboratories are quite well equipped to give the students a comprehensive course.

For analytical work and carrying out preparations on a small scale a commodious laboratory is located in the Chemistry Department and is completely equipped. It is provided with a muffle furnace, steam baths and drying ovens and separate space is set apart for the recovery of solvents. An adjacent laboratory contains analytical balances, refractometers, microscopes, a tintometer, centrifuge, colorimeter, nephelometer, spectrometer and other instruments necessary for an up-to-date analytical work on foods, drugs and water. For the teaching of Pharmacognosy there is a good botanical laboratory with a museum of drugs and a collection of plates and slides.

A manufacturing laboratory, designed for large-scale production, is situated in the Chemical Technology building and is provided with various machines for the grinding of crude drugs and the manufacturing of tinctures, extracts, confections, tablets and pills of various kinds, milk products, preserved fruits, tooth pastes, cosmetics, fine chemicals, etc. Many of these

can be worked with the hand or with electrical power. Arrangements are being made for steam supply.

The library has a comprehensive collection of standard books dealing with the various aspects of Pharmacy and subscribes for a number of journals which bring knowledge up to date. Further it possesses a number of classical books relating to Indian *Materia Medica* and Pharmacy which are now out of print.

The lectures, laboratory work and the manufacturing operations will be carefully conducted by lecturers who have received special training in the particular lines. The syllabuses for the courses have been framed specially to meet the needs of Indian conditions. Before the students begin their special work in Pharmacy they would have received a sound basic training in physics, general engineering including machine drawing and workshop practice, chemistry, industrial chemistry and chemical engineering. They will therefore be capable of intelligently understanding and conducting manufacturing operations and also be fit to benefit by their training in analytical Pharmacy. Thus the graduate will be capable of taking up positions as manufacturing chemists or as analytical pharmacists.

It is well known that the pharmaceutical industry is specially suited to India owing to the wealth of raw materials available in the country and the large quantities of manufactured drugs that are being used every year. There is a serious lack of properly qualified pharmaceutical chemists in the country in charge of pharmaceutical business anyway comparable to the trained band of men who manage it in advanced countries elsewhere. The Central as well as the Provincial Governments are now alive to the urgent need for effecting control of foods and drugs sold in the country. In due time every large hospital and every municipality will surely realise the need for trained men in foods and drugs to effect economy and to control their purchases and expenditure as is being done in Europe and America. For all these purposes a large band of specially trained men is a necessity and the Drugs Enquiry Committee as early as 1931, emphasised the need for Universities to start courses in Pharmaceutical Chemistry and supply the necessary technical men.

The Andhra University has provided for a three-year course leading to the B.Sc. Honours degree in Technology with specialisation in Pharmaceutics and subsequently a one-year course of advanced work in the subject leading to the M.Sc. degree. Students who have passed the I.Sc. with distinctions are admitted to this course which lays greater emphasis on the manufacturing side. The University has also been conducting an M.Sc. course in the Analytical Chemistry of foods, drugs and water on the same lines as the M.Sc. course of the London University. These graduates with further experience will be able to appear for the Fellowship examination of the Institute of Chemistry of Great Britain and Ireland in Branch E (Foods and Drugs). The work done during this course mainly is of a practical nature. The students analyse a large number of representative samples of foods such as milk, butter, oils and fats,

condiments, etc., water, urine and blood and receive instruction in the fundamentals of bacteriology, pharmacology, microscopy, foods and drugs laws, etc., which will enable them to interpret analytical data intelligently and draw correct conclusions.

Provision has recently been made for a number of scholarships which are available for bright students taking up these courses. There have been a large number of enquiries from students all over the country including such distant provinces as the Punjab. The courses are obviously useful to the country and hence are popular. Detailed information can be obtained from the Principal of the University Colleges, Andhra University, Waltair.

It may be mentioned here that besides Pharmaceutics, a sound course in general Chemical Technology including Chemical Engineering and the Technology of Sugar has been taught as a special subject during the past five years. With the co-operation of the sugar factories situated in the Andhra districts efficient training has been given in this branch of Technology. Now the study of Pharmaceutics has been added and very soon the Technology of Oils is also expected to be provided for. The students have, therefore, a wider choice of selecting career. The laboratories afford ample scope for advanced research work in these subjects.

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University of Mysore.—*Personnel.*—Dr. M. V. Gopakaswami, B.A., B.Sc. (Lond.), Ph.D. (Lond.), Professor of Psychology and Logic, Maharaja's College, Mysore, was appointed a "University Professor" under Section 3 of the Mysore University Act, 1933.

Examinations.—The results of the Arts and Science Examinations, held in March 1938, were announced. They were as under:—

Examination	Examined	Passed
1. Intermediate	1,175	396
2. B.A. (New)	158	80
3. B.A. (Old)	3	nil
4. B.Sc.	209	123
5. B.A. (Hons.) Preliminary	47	36
6. B.Sc. (Hons.) Preliminary	44	41
7. B.A. (Hons.) Final ..	29	29
8. B.Sc. (Hons.) Final ..	21	21
9. M.A. Qualifying Test ..	2	2
10. M.Sc. Qualifying Test ..	2	2

Recognition.—The Royal College of Surgeons of England have recognized the Mysore Hospital (Sri Krishnarajendra Hospital) in respect of the Final Examination for the Fellowship of the Royal College of Surgeons under Paragraphs 21 and 23 of the F.R.C.S. Regulations.

General.—Mr. A. R. Gopala Iyengar, M.Sc., Lecturer in Botany, Intermediate College, Bangalore, has been awarded the Vincent Massey Scholarship for 1938-39, for the study of Applied Botany in the University of Toronto.

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Announcements

The Third International Congress of Tropical Medicine, which was to have been held at Amsterdam, and the Third International Malaria Congress, which was to have been held at Madrid

in 1935, had both to be postponed, but a joint Congress will be held at Amsterdam from September 24—October 1 under the Presidency of Dr. G. Gryn. Further information can be obtained from the Secretary, Mauristkade 57, Amsterdam.

The Wister Institute of Bibliographic Service.—Authors' abstracts of all papers appearing in the Wister Journals: *The Journal of Morphology, The Journal of Comparative Neurology, The American Journal of Anatomy, The Anatomical Record, The Journal of Experimental Zoology, American Journal of Physical Anthropology, Journal of Cellular and Comparative Physiology, The Journal of Nutrition, American Anatomical Memoirs*, are to be issued in the new Advance Abstract Card Service within 90 days of acceptance of abstract.

The present advance abstract sheet, given free for the past 14 years, will be discontinued with the June 1938 issue, to be replaced beginning in July by the new form of service. The new Card Service has been planned to meet all the needs of librarians and investigators, and is to be offered in three styles.

Annual's Description.

Style No. 1. Advance Abstract Cards in sheets. 4 Abstracts per card—300 mm. x 125 mm. ..	\$2.00
Style No. 2. Advance Abstract Card Service, sheets cut into cards—75 mm. x 125 mm. ..	\$2.50
Style No. 3. Advance Abstract Card Service, permanent library card punched—75 mm. x 125 mm. ..	\$1.00 or \$5.00 for 2 sets.

From July to December, 1938—one-half annual rate.

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We beg to acknowledge with thanks, receipt of the following:—

- “Agricultural College Magazine, Nagpur.” Vol. 12, No. 4.
- “Agricultural Gazette of New South Wales.” Vol. 49, No. 5.
- “Journal of Agricultural Research.” Vol. 59, No. 4.
- “Indian Journal of Agricultural Science.” Vol. 8, No. 2.
- “Monthly Bulletin of Agricultural Science and Practice.” Vol. 29, No. 4.
- “Journal of the Royal Society of Arts.” Vol. 86, Nos. 4457-61.
- “Biological Reviews.” Vol. 13, No. 2.
- “Communications from the Boyce Thompson Institute.” Vol. 9, No. 3.
- “Chemical Age.” Vol. 38, Nos. 682-86.
- “Journal of Chemical Physics.” Vol. 6, No. 5.
- “Journal of the Indian Chemical Society.” Vol. 15, No. 3.
- “Journal de Chemie Physique.” Vol. 35, No. 2.
- “The Calcutta Review.” Vol. 67, No. 2.
- “Russian Journal of General Chemistry.” Vol. 8, Nos. 3 and 4.
- “Experiment Station Record.” Vol. 78, No. 4.
- “Transactions of the Faraday Society.” Vol. 34, No. 205.