

constituents of the group. He is not interested how the whole group is situated. For instance to the Geometer it may not matter whether an egg is placed on a table on its end or its side. He is concerned with the oval shape only and the properties say of its chords and tangents, etc. To the Mechanist the distinction is vital for on it depends whether the egg will stand or fall or if disturbed from its position will break or not. He is concerned with the Statics and Dynamics of the circumstance.

But consider the Artist. He also draws his stimulus from the world around him as do the Geometer and the Mechanist. He also takes extracts from the real continuum of existence. He is also concerned with form, movement, force and even mass, because equilibrium and balance are essential to æsthetics. His activities are however primarily social whilst those of the scientist are only in the narrower sense social in that they might provide material for the correct action to be taken for material prosperity of the Society. Like the Psychologist and the Sociologist the Artist focusses his art on the relation of man to his environment, on the activities, the joys, the sorrows that are stimulated in human beings by human beings and nature. In this sense he might depict in art the "spirit" of man. He might detach himself from his objectives and go to a higher level of abstraction but taken as a rational endeavour on his part, Art affects the emotional reaction of social

beings with the rest of the human beings. The Artist is most concerned with the world around him. To this extent his work is drawn from the realities of Nature which the Scientist studies on logical basis. The novelty about his work is that he brings social appreciation to bear on his abstractions. Thus although in his work the detailed form may bear resemblance to Nature, the general form need not. The resemblance of the detailed form to Nature is essential to achieve interpretation. It is in this sense that the Artist cannot depart completely from qualities of a scientific nature. It is in this sense that all good science must exhibit a certain amount of artistry and all good art must satisfy certain scientific requirements. It is here that Science and Art are inter-connected.

Instances of such relations are numerous. It is an elementary result in statics that a triangle on a broad-base with its vertex within the base-line remains in stable equilibrium. The stability will suggest that it is devoid of movement. Hence the Pyramids of Egypt convey the idea of time-lessness and eternity. Hence also the teaching posture of Buddha in the Ajanta and Ellora rock-temples with its broad triangular outline with a broad base conveys Nirvana (Supreme Bliss) the eternal hope of man. An obtuse-angled triangle with a tilt forward depicts strain. A man dragging a load with a rope would form such a triangle with the load and the ground.

EXPLOSIVE RIVETS

A NEW use for aluminium is the manufacture of explosive rivets in which a charge of powder takes the place of a riveting hammer for expanding the driven end. The explosive rivet is specifically adapted to the fastening together of metal plates which are accessible only from one side, but will doubtless find much wider application.

The explosive rivet has a cavity in the aluminium shank in which is placed a small charge of a high explosive, which is set off when the rivet is heated up to a critical temperature. The heat necessary is furnished by a special riveting iron—a silver-tipped electrically heated tool held against

the rivet head. In about 2 seconds the rivet is heated sufficiently to cause the necessary explosion, which expands the shank of the rivet in such a way as to fasten together securely the metal sheets. The rivets now being made are of aluminium alloy, only $\frac{1}{8}$ in. diameter, but the development of larger rivets, up to $\frac{1}{4}$ in. diameter is proceeding. They are supplied in the age-hardened condition and do not need the careful refrigeration following heat-treatment before use which is necessary with rivets of the same alloy that are used for ordinary clinching.—(*The Times, Trade and Engineering*, Vol. 50, Jan. 1942, p. 36.)

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STRUCTURE OF THE BAND SPECTRUM OF PHOSPHORUS AND NUCLEAR SPIN

THE band spectrum of phosphorus, as excited in a discharge tube has been photographed with a Hilger large Quartz Littrow Spectrograph and the bands (9, 21), (5, 21), (5, 18) and (4, 18) have been measured. The analysis of their rotational structure has led to the following values of the constants (in cm^{-1}).

$$B'_4 = 0.2346 \quad B''_{18} = 0.2799$$

$$B'_5 = 0.2323 \quad B''_{21} = 0.2736$$

$$B'_9 = 0.2255$$

The constant for $v' = 9$ agrees with that obtained previously by Herzberg¹ and also by Ashley,² the others being newly obtained. The absence of any perturbations in the rotational structure of the bands (5, 21) and (5, 18) has shown that the perturbations pointed by Herzberg must be only vibrational.

Elaborate quantitative measurements have also been made of the alternating intensities of the rotational structure lines in the case of the bands (5, 21), (5, 18), (6, 22) and (9, 21). The (5, 21) band alone gave an anomalous value 3.3, while for the others, the ratio, on an average, is 3.0. Such a high value (3.4 to 3.5) was obtained for this band also by Jenkins.³ But the anomaly cannot be ascribed to any effect of perturbations as the (5, 18)

band does not show the anomaly and the rotational structure has not revealed any perturbations. The high value is shown to arise from superposition by a faint band.

The intensity ratio leads to a value of $\frac{1}{2} \frac{h}{2\pi}$ for the nuclear spin of phosphorus, as determined by Ashley and Jenkins. Details of the results will be published elsewhere.

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Solar Physics Observatory,
Kodaikanal,
August 30, 1942.

¹ *Ann. d. Physik*, 1932, 15, 677.

² *Phy. Rev.*, 1933, 44, 919.

³ *Ibid.*, 1935, 47, 783. (Letter).

A PRELIMINARY NOTE ON THE INCIDENCE AND CAUSATION OF GLYCOSURIA IN PREGNANCY

ABOUT three hundred pregnant women attending the ante-natal clinic of the Bai Jerbai Wadia Maternity Hospital, Parel, Bombay, were examined. Their diet, as far as it could be gathered from personal history, was in most cases lacking in milk, fruits and green vegetables. The cereal consumed consisted almost exclusively of rice. Glucose was found to be present in the urine of about 30 per cent. of the subjects during the 7th, 8th and 9th months of pregnancy. Glucose tolerance tests of these