17.11	110.1±1.0	108.4	126.7±1	240.5	181.9±1
		125.6	125.9±1	370.0	183.6±1
		142.3	129.5±1		
		274.6	128.7±1		

Table II. Saturation backscattering (%).

Source	Backing materials								
	None	$_6$C	$_{13}$Al	$_{29}$Cu	$_{48}$Cd	$_{50}$Sn	$_{74}$W	$_{82}$Pb	Glass
C^{14}	100.0	—	110.1±1	118.3±1	—	126.7±1	139.3±1	140.2±1	108.5±1
P^{32}	100.0	114.1±1	127.0±1	149.0±1	165.3±1	166.0±1	—	182.9±1	125.5±1

Table III. Energy spectrum of P^{32} with and without Pb-backing.*

Energy region of β-rays expressed by range in Al. (mg/cm^2)	Counts of β-rays (arbitrary unit) Pb-backing	No-backing	Difference
0～40	676	200	476
40～80	1400	600	800
80～120	1800	920	880
120～160	1600	1030	570
160～200	1470	920	550
200～240	1230	740	490
240～280	950	650	300
280～320	680	470	210
320～360	520	365	155
360～400	370	290	80

* The thickness of this Pb-backing is 2mm, which is much thicker than that gives saturation backscattering.

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6. On the Rolling and the Recrystallization of Aluminium

Masashige Koyama

(Uchino Second Laboratory)

The inner structure of metals and alloys in the pulverized or rolled state, especially of those, iron, nickel, copper and brass has been examined with X-rays in our laboratory.

In the present work, the relation between the reduction percentage and the hardness of the rolled aluminium plates as well as the variation of hardness with the annealing temperature was studied. Meanwhile X-ray analyses were also carried out concerning those items, the fibre structure of several aluminium plates, the change of recrystallization temperature with impurity, and the inner structure change due to the annealing.

The specimens used in this experiment were prepared by rolling the polycrystal aluminium (99.99%, 99.9% and 99% in purity) in various degrees, which had previously been annealed in vacuum at 400°C for 1 hr., at 450°C for 4 hrs. and at 500°C for 4 hrs. respectively. The X-ray examination was performed by the Laue method, utilizing the heterogeneous X-rays emitted from Cu anticathode.

The results thus obtained will be summarized as follows.

(1) The hardness of specimens increases rapidly from the reduction percentage of 20~30%, whereas it decreases slightly at 50~60% and then increases again up to the reduction percentage of 80%.

(2) Comparing the diffraction patterns actually obtained with the theoretical ones calculated by the aid of Nishikawa's formula, the following results were obtained: the fibrous arrangement of the specimens which were rolled to the reduction percentage of 50~70%, was consisted of micro-crystals with their <112> and <110> axes parallel to the direction of rolling; and that of those specimens at 80~92% wss consisted of the same with <110> and <111> axes; and lastly at the reduction percentage over 99%, <111> was the only common axis.

(3) The hardness of the specimen of the reduction percentage of 80% increases again at the annealing temperature of 150°C~200°C (for 1 hr.).

(4) The higher the purity of aluminium, the lower the recrystallization temperature becomes.

(5) In the specimens of the comparatively higher reduction percentage of 97%, the micro-crystals rearranged by annealing at the temperature of 400°C~450°C (for 1 hr.) are smaller than those at the temperature of 300°C~350°C (for 1 hr.).

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7. On the Inner Structure of Copper Deposited from the Difference of the Electrolytical Solutional Tension

Hidekiyo Fujihira

(Uchino Second Laboratory)

Although many investigations have hitherto been carried out concerning the X-ray analysis of the crystal configurations in some electrodepasited metal and alloys, only those X-ray analyses on silver and head have been reported that were deposited from the difference of the electrolytical solutional tension.

In the present investigation, the metallic coppers were used as specimens which